INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC
GUTTA-PERCHA
Reg. U.S. Pat. Off.
Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York

Telephone—Bryant 2576

CABLE ADDRESS: IRWORLD, NEW YORK

Member of the National Publishers' Association

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 70 July 1, 1924 No. 4

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made on application.

REMITTANCES: Should always be made by bank draft, Post Office or Express Money Order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

Copyright, 1924, by The India Rubber Publishing Co.

Table of Contents.....Text Page 710
Advertisers' Index .....Advertising Page 108
Classified Advertisements.....Advertising Pages 68-74
Buyers' Directory.....Advertising Pages 80-106

Is the Crêpe Sole Patented?

IT WOULD almost seem so, if the British patent No. 100,727, granted June 18, 1915, is to be taken seriously. In workaday terms, this describes crude rubber "broken down" by means of rolls, thus producing a rugose surface, vulcanized, and used for a variety of articles, among which are soles for bathing slippers.

Thinking it over, crude rubber comes into being the instant latex is coagulated. When it is rolled or massed, if that happens minutes or years after coagulation, that is breaking down. Hence, granting that the patent be sustained, are not those who do not get permission from the owner of the afore cited patent, infringers? And does not the possibility of back royalties loom?

Of course the patent specifically describes a vulcanized product. But, as was pointed out when unvulcanized crêpe first took the popular fancy, a vulcanized crêpe is so far superior that it was sure to be introduced.

The claims cover a product "made by passing crude rubber through rolls until it is partly broken down . . . used in making massage wash cloths, bath mats, complexion cloths, handles for fishing rods, motorcycles, etc., footwear, such as bathing slippers, and for other purposes. . . ." The vulcanization process, a cold or hot one. All of these points have been patented for nine years.

Estimating Tire Stocks

HOPE for better things lies in the effort being made by the Rubber Association of America to accumulate and to arrange methodically data that will help every tire manufacturer in forming better estimates of trade needs and conditions. Fully 120,000 tire dealers are being asked to frankly state, for the benefit of the tire manufacturers' division, how many pneumatics, solids, and inner tubes they have in stock. Also if they sell accessories, oil, gasoline, automobiles, or other articles, if vulcanizing be done, and whether or not tires and tubes have the major place in their total sales. A very encouraging portent is the assurance of cordial cooperation by the National Automobile Tire Dealers' Association.

Doubters, impatient of statistics, may claim that figures can befuddle as much as they can help, but the truth is that only through the possession of abundant knowledge of facts and quantities has any great progress been made in human activities. Governments that have endured, religions that have flourished, scientists that have most benefited mankind, and industrial enterprises that have waxed great have all deemed the collecting and classifying of vast funds of specific information as indispensable to success. Figures may be abstract things, but they can, for instance, tell a very concrete story to a clear-visioned financier, who, in making wide surveys as guides for investments, weighs wages against commodity costs, purchasing values, labor scarcity or surplus, bank deposits and specie ratio, clearings, loans, interest, and discounts, exports and imports, and other useful economic factors, and thus arrives at conclusions that mean substantial advantage to him and to his clientele.

So, too, the findings sifted periodically from the tire questionnaires should be very beneficial to makers, dealers, and consumers. Indeed, if a true knowledge can be obtained of the status of even three-quarters of the crude and manufactured rubber stock in the country a long step will be taken in the direction of achieving one consummation devoutly to be wished, greater stability not only in tire making but in the entire rubber industry.

Rubber Floors, Soles and Heels

ONE of the foremost of the nation's hygienists, Dr. A. B. Emmons, 2d, Director of the Harvard Mercantile Health Work, in a recently published article on feet, floors, and health gives rubber the first place. Heavily padded soft carpets, he says, may appear very restful but walking upon them all day is much more tiring than pacing tile or concrete. The latter, indeed, afford a firm grip for the feet, but the same confidence is imparted in treading upon a reinforced rubber floor, which also gives a springy step; and, too, it is quiet, dustless, easy to clean, and so resilient that even a piano upon it leaves no marks.

He has also a good word for rubber soles and broad rubber heels, which give the wearer not only much ease but also steadiness and assurance in walking. For preserving the normal foot in the pre-school age of children it is interesting to learn that, next to going barefoot, nothing is more efficient in developing feet naturally than the wearing of sneakers with rubber soles. Especially significant is the fact that the doctor does not even hint that rubber-soled shoes "draw" the feet or cause any other physical discomfort.

An Export Sermonette

AMERICAN manufacturers have so long found the home market capable of absorbing practically all their products at profitable prices that they have troubled themselves but little with the perplexities of foreign trade. But the plain truth is that, willing or not, the fast mounting output of our factories and keen competition at home are but two factors that already force us to look for markets even far beyond the general confines of our own country.

All this spells contending for advantage with commercial adversaries who have had the benefit of a century's experience in dealing with customers in continental and other fields overseas. Compared with them most Americans are still but tyros in the game, failing to cultivate the good graces of the purchasers and caring little for their demands.

Some years ago American fruit fell into disfavor in England, and dealers displayed such humiliating signs as, "These are not California oranges." From that experience, however, American citrus growers learned a valuable lesson, and now British dealers are proud to display fruit from the Golden State. Nor have all rubber manufacturers been slow in learning the obligations of exporters in foreign trade. One in particular merits due credit for the attitude he has taken.

The manufacturer referred to sold to a foreign buyer a lot of high quality inner tubes. Soon afterward the buyer wrote complaining that the whole consignment was faulty and intimating that he of course expected to be "done" by an American firm. Instead of showing impatience and resentment, he notified the buyer that not only would no charge be made for the goods, but that an entirely new lot would be sent in their place on approval. This caused the buyer to investigate personally and he found that only three tubes had given any trouble and then only through a clerk's careless handling. He apologized, cheerfully paid for both lots, and has continued as a good customer ever since.

Factories and Universities

SCARCELY any need of our modern business life has been more urgently emphasized in these columns than that of a closer understanding, if not a warm accord or an actual working agreement, between the nation's industrial and educational forces. It has been repeatedly pointed out that if American manufacturing interests are to hold their own with competitors in foreign fields, much less retain general supremacy in the commercial world, they must realize that even the production of superior goods and exceptional enterprise in marketing, highly essential as both factors are to success, will not insure commanding position. They must be supplemented, or rather reinforced, with the special training of an ample number of minor and major leaders for leading industries.

The United States census showed that in 1920 of the 41,614,248 persons then gainfully employed only 1,510,129, or 3.6 per cent, planned the activities and directed the occupational energies of the 96.4 per cent. In 1870 the proportion of administrators, supervisors, and technical experts was but 1.25. In 1900, when the era of large scale production began, it had risen to 2.46. What may it or should it be in 1930? A census estimate, taking little account of the increasing complexities of business, would put the 1930 need close to 4 per cent; but the chances are that in 1930 this requirement will be between 4½ and 5 per cent. Even an army maintains a ratio of 4 per cent of officers.

The manner in which engineering schools can help to meet this exigent need has already been pointed out; but we cannot be content even with their valuable aid. The active cooperation of most of the higher institutions of learning could and should be enlisted in enhancing the success of industrial mass production. It is a vital, extensive, present-day problem in which great schools, through endowments and in other ways, are and must be increasingly concerned. The industries need numerous technical college graduates. If the latter have a more liberal education they will be much more efficient and doubly welcome.

IF THERE IS GOING TO BE A GENERAL TIRE PRICE CUT, as is indicated by the recent Fisk reduction, there is little hope of the tire industry regaining its pre-war earning power during 1924.

"HE THAT OPPRESSETH THE POOR TO INCREASE HIS riches, and he that giveth to the rich, shall surely come to want." Proverbs, 22:16.

Rubber Sleeves Protect Propeller Shafting from Corrosion[1]

Repairs on the *Leviathan* Have Taught the United States Navy How to Prevent Galvanic Corrosion of Exposed Steel Shafting by Means of Rubber Sleeves

A NEW and important use for rubber has been developed by the United States Navy in the successful adoption of rubber sleeves for the protection of steel shafting from corrosion. Some form of protection of the exposed portions of shafting from galvanic corrosion is of utmost importance in vessels with underwater body sheathed with copper. This is made evident, for example, by the fact that since October, 1922, the Boston Navy Yard has had to replace seven propeller shafts and two stern tube shafts on the *Denver*, *Tacoma*, *Cleveland* and *Galveston*.

Former Protective Method

Heretofore the best known method of protection proved utterly inadequate. It took the form of composition sleeves shrunk on to the shaft in sections of such length as could be conveniently handled. The joints between the sections of the sleeve were sealed by pumping the annular ring between the overlap of adjoining sections full of red and white lead and boiled linseed oil. With the working of the shaft alternately ahead and astern, however, the joint loosened up, the lead hardened and crumbled, salt water gained admission to the shaft and active corrosion commenced immediately. In a very short time the shaft was so pitted and weakened as to crack or fracture entirely.

What the *Leviathan* Disclosed

When the *Leviathan* was placed in dry dock at South Boston for repairs not long ago one of her propeller shafts was replaced by a spare, on account of a crack in one of her composition sleeves. It was noticed on this shaft that a space of approximately 18 inches between two adjacent composition sleeves was filled with a rubber sleeve. This had evidently been in place since the vessel was built, or at least seven years, and was in perfect condition except for a cut made by the hoisting slings. It was firmly adherent to the steel beneath, which was in perfect condition, with no trace of corrosion.

Because of the cut in this rubber sleeve it was necessary to replace it, which was satisfactorily done by the United States Rubber Co.

Rubber Sleeves for the U. S. S. *Denver*

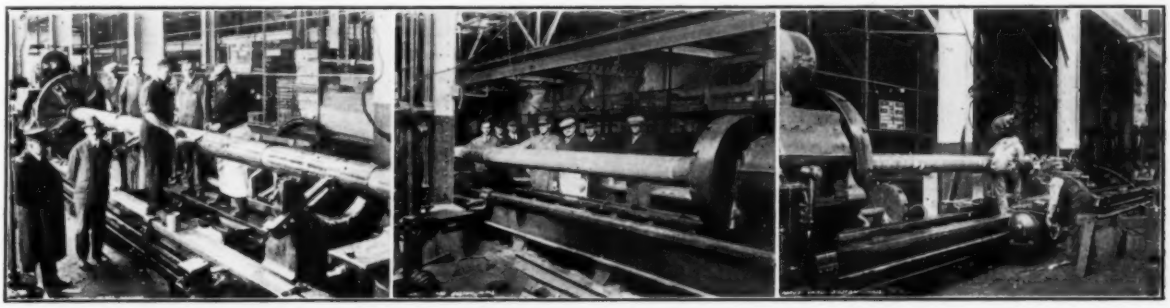
On docking the U. S. S. *Denver* at the Boston Navy Yard in December, 1923, it was found that serious corrosion made necessary the replacement of her propeller shaft, which, since April, 1923, had become slightly pitted circumferentially under each joint in the sleeves to a depth of approximately ⅛ inch.

A new spare stern tube shaft, completely sleeved as per old specifications, was drawn from store to replace the condemned shaft. It was 32 feet 2 inches in length and had 8 sections of composition sleeve fitted, making 7 joints in all. In view of the demonstrated inefficiency of the old-type joint, and having in mind the remarkably successful employment of a rubber sleeve on the *Leviathan's* shaft, it was decided on this to eliminate the old-style joints between the sections of sleeve and to substitute therefor rubber joints of approximately 4 inches in length.

Preliminary Preparation

On the propeller shaft all of the composition sleeves were removed except the after strut bearing sleeve and a short section near the coupling, and it was decided to substitute for the sleeves removed a continuous rubber sleeve approximately 13 feet long.

The shaft was centered in a lathe and the sleeves turned off at the joints to a width of four inches, which width was decided upon as the shortest joint which would leave room to properly work the rubber. Each section was underscored at the ends by a 45-degree bevel from outside diameter of sleeve to shaft. The surface of the steel shaft and the undercut of sleeve was rough cut to about 14 threads per inch to aid in the cohesion of the rubber.



APPLYING THE RUBBER STOCK — COMPLETED SLEEVE BEFORE WRAPPING — APPLYING BRASS PROTECTING STRIP

Development of Rubber Sleeves for Propeller Shafts at the Navy Yard, Boston, Massachusetts

Applying the Rubber

In applying the rubber the exposed section of shaft was first well washed with carbon bisulphide to remove all oil or grease, and then painted with two coats of rubber cement. The rubber filling, which was supplied in large rolls about a yard wide and ⅛ inch thick, was cut into sheets the proper size to go around the joint, ends scarfed where the joint occurred, and applied one layer at a time with additional strips at the ends to build up a fillet. Each layer as it was applied was well worked with small knurled rollers, great care being taken to get rid of all air bubbles or pockets, the sheet being punctured with awl or knife as necessary. After a layer was in place, it was painted generously with carbon bisulphide, as was also the next layer of rubber, which latter was painted on both sides and allowed to stand three minutes before being applied.

Three layers in all were applied, making the thickness of the rubber ⅜ inch, and the whole was then tightly bandaged with strips of muslin wound spirally under considerable tension, until

[1] Commander Paul E. Dampman, United States Navy, Engineer Officer, Boston Navy Yard, in the *Journal of the American Society of Naval Engineers*, Vol. XXXVI, No. 2, May, 1924.

the vulcanization, which proceeded automatically from the chemical action of the carbon bisulphide upon the prepared rubber, was completed. This required, at a temperature of 55 degrees F., a period of 24 hours. This time could be much reduced by raising the temperature. At 80 degrees F. 12 hours would be required and at 212 degrees F., only two hours. At the completion of the curing, the muslin bandages were removed and the rubber sleeves carefully inspected.

The long rubber sleeve on the propeller shaft, which measured 12 feet 10 inches in length, was applied in a similar manner.

It was suggested by the representative of the United States Rubber Co., who supervised the work, that a layer of rubber impregnated cords, such as are used in the manufacture of cord tires, wound tightly around the shaft just before the outside layer of rubber was applied would greatly increase the mechanical strength and durability of the rubber sleeve.

It was therefore proposed to incorporate this feature in the next job of a similar nature to develop at the Boston Navy Yard. This proved to be a spare propeller shaft for the S. S. *George Washington*, which had a rubber sleeve approximately fifteen feet in length. The surface of this sleeve contained numerous fine cracks such as appear in old rubber; it was hard and brittle and had been gouged in several places. A new rubber sleeve was fitted but, in working out a scheme for securing additional mechanical strength as protection from possible abrasion, a layer of breaker fabric similar to that which is used in the construction of automobile tires was placed under the outer layer of rubber. The typical rubber sleeve, therefore, consists of two layers of rubber, followed by a layer of fabric and finally covered with a thin layer of rubber. Such sleeves are now being applied to the U. S. S. *Galveston*.

Extra Propeller Shaft Protection

For the long rubber sleeve on the propeller shaft, which was exposed, some form of protection from mechanical injury and from possible attack by marine growths was considered advisable. (The rubber sleeve on the *Leviathan's* shaft was within the stern tube.) This protection took the form of a sheet brass strip, 1/16 inch thick and 3 inches wide, made up in a long coil with joints riveted and brazed, and wound spirally over the rubber sleeve under considerable tension. It was secured to the composition sleeves at each end by means of countersunk head machine screws.

Material Used

The material used consisted of uncured sheet rubber, calendered ⅛ inch thick (United States Rubber Co. compound G-520), and was furnished in rolls about a yard wide, rolled up with cotton sheeting between the layers. The cement was made by dissolving the above rubber sheet in benzol in proportions of 4½ pounds of rubber to one gallon of benzol, the benzol being chemically pure and free from carbon bisulphide. The carbon bisulphide was of the ordinary commercial grade. Precautions should be taken to store the rubber material away from the carbon bisulphide, as it is affected by the fumes of the latter; also care should be taken in handling both the benzol and bisulphide, the vapors of both being explosive when mixed with air.

Another Form of Protection

In addition to the corrosion due to leakage between sleeve joints, there has been considerable difficulty caused by leakage and corrosion at the commencement of the propeller taper. In order to secure a better and tighter joint at this place, a rubber packing ring was developed. This has now been in use for over a year and shafts recently examined have shown no signs of corrosion at the taper.

Naval and rubber experts believe that the success of these experiments indicates great future possibilities for similar uses of rubber not only in marine work but in certain branches of industry, and great savings in time, materials and expenses will be effected.

Curing Tires at Low Temperatures

By J. M. Ball

The rapid increase in popularity of low temperature accelerators of vulcanization is due to their valuable technical and economic advantages, especially evident in tire and tube production.

It is well known that rubber cured at low temperatures is better than that cured at high temperatures because it has not been harmed by excessive heat. Rubber combined with sulphur is elastic and strong but heat alone makes it soft and weak. Therefore, reducing the curing heat produces better products. This fact is valuable in the production of pneumatic tires. The custom of curing tires at 40 to 50 pounds of steam, 287 to 298 degrees F., originated some years ago when non-accelerated high grade stocks were cured in a reasonable time, about 3 hours, at that heat. This cure is continued because the popular accelerators of today happen to work best at that point. For example, a Hexa stock which cures well in 90 minutes at 45 pounds is worthless when cured for any length of time at 35 pounds.

Advantages of Low Temperature Accelerators

There are now available a number of accelerators which react perfectly at 20 pounds of steam, 258 degrees F. These actually cure more rapidly than those active only at high temperatures. The use of these accelerators not only obviates the harm done to rubber by heat but improves greatly the tensile and stretch, stiffness, energy of resilience, and abrasive resistance of the rubber. Moreover, both natural and accelerated aging results obtained are entirely satisfactory.

Low-temperature accelerators have many advantages in curing tires. They permit cure of a 4-inch airbag tire at 20 pounds of steam in an hour or less. They make possible a better tire than one cured at 40 pounds, render practical the production of high-grade tires with low cost treads and frictions. Reduction of curing temperature avoids injury to the fabric by heat. Fuel is also economized at the lower boiler pressure. The life of air bags is increased because lower sulphur content, about three per cent on the rubber, is used in the friction and the low temperature slackens migration of internal free sulphur to the bag surface.

Curing Balloon Tires

The large size of balloon tire molds raises a serious problem in curing facilities since so few can be contained in an ordinary tire vulcanizer. The balloon tire bulk distinctly retards effective transmission of heat to its interior. Therefore, to secure production efficiency and optimum cure in all parts of the tire it becomes essential to use in the friction stocks some accelerator which is active at the low temperature prevailing in the interior of the tire carcass during the brief curing time prevailing in current practice. With such an accelerator no difficulty is experienced in securing uniformity of cure in all parts of the tire.

Success with these accelerators is dependent upon precaution not to over stimulate the cure by excess of accelerator, heat or time. It has been found from over a year's use in different plants that some of them are entirely practicable on large scale production.

ADVANCES ARE SHOWN IN THE 1923 VALUATIONS OF ALL THREE lines of mechanical rubber goods as imported from the United States by British South Africa. The figures for rubber belting rose from $261,708, in 1922 to $277,978 in 1923; rubber hose at $168,041 in 1922 advanced to $201,299 in the year following; while the value for packing increased from $26,581 in 1922 to $31,382 in 1923.

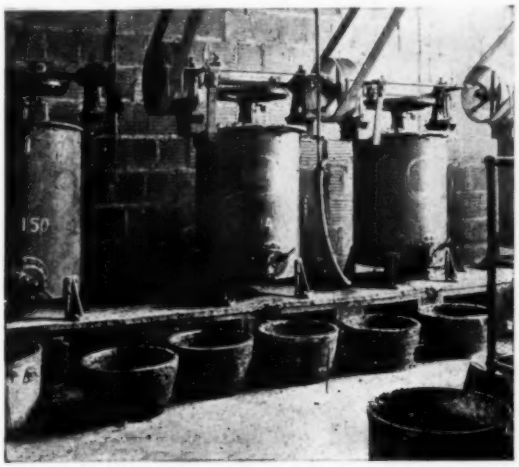
LEADING IMPORTERS IN APRIL OF AMERICAN-MADE RUBBER thread were: England, taking goods valued at $27,235; France, $20,511; and Japan, $17,418.

Manufacture of Automobile Topping

Single and Double Texture—Burlap Backed Topping—Mixing Stocks and Cement Making—Rubber Spreading and Calendering—Automatic Weighing—Pyroxylin Surfacing—Embossing—Vulcanization

THE annual requirements of automobile topping in the United States are sufficiently great to require the exclusive output of a number of large plants equipped in general as combination rubber and pyroxylin coating factories. The production of topping material required for new equipment and repair work figured on the motor car output for 1923, is not far from 32,000,000 yards of goods 60 inches in width. Approximately half this yardage is single texture rubber or pyroxylin coated and half double texture in which the binding coats are rubber. On much of the latter yardage, rubber is also used as the outer coat either surfaced or unsurfaced with pyroxylin or artificial leather as finish. Variations of color, grain and quality of fabrics in topping total a large number of styles adapting the material for use in place of leather on upholstery and bookbinding work as well as for vehicle topping.

In all of these variations rubber is used for weather proofing,



The J. H. Day Co.

Churns for Cement Making

flexibility or adhesive binder in case of double textures. Pyroxylin serves as a strong elastic weather proofing affording durable wearing quality, luster and color effects. The advantages of each type of topping may be briefly mentioned.

Single and Double Texture Topping

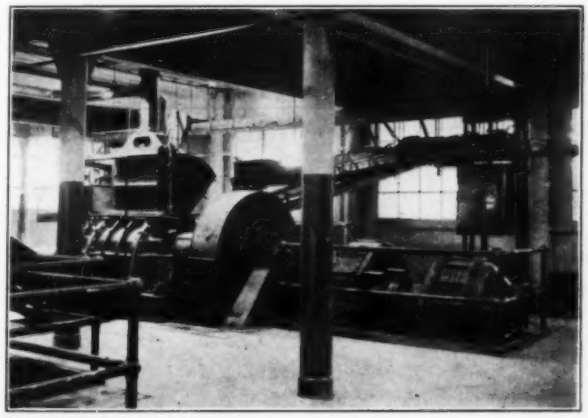
Single texture rubber affords the least expensive, lightest and most pliable topping, in which quality is less regarded than initial cost and surface appearance. The fabric base of this variety is a light weight drill, usually dyed black.

Double texture rubber has a grained rubber surface on drill backed with a whipcord mixture. Goods of this construction with coarse grain surface make this quality much more substantial and durable than the single texture.

One style of double texture consists of plies of sheeting and heavy drill or whipcord backed together by a rubber binder. The surface is rubber coated, deeply embossed with a long grain pattern surfaced with pyroxylin. This style of graining allows the application of a thin color coat of pyroxylin, which, while still wet is wiped off from the ridges of the grain and allowed to remain in the depressions, thus giving to the goods pleasing two tone effects esteemed for the brilliant, snappy style it gives to roadster, touring and sport cars, in color blended or contrasted with the body of the car. The colors used include tan, khaki, olive drab, blue, gray, green, maroon and red.

Burlap Backed Topping

The latest construction of double texture auto topping is made of rubber coated sheeting pyroxylin surfaced and backed with



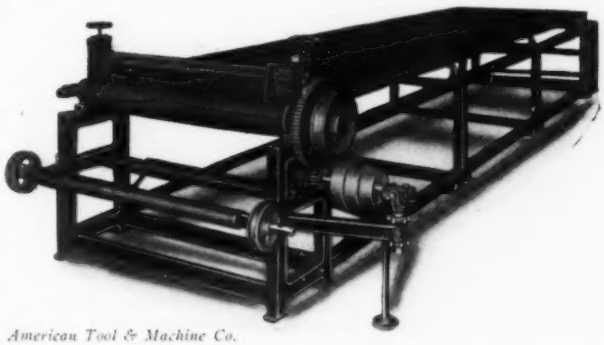
Birmingham Iron Foundry

Banbury Enclosed Mixers

burlap. This combination is a thoroughly strong and durable double-deck material and represents the result of a logical development in automobile topping to secure maximum strength and service as closed car roofing material. The use of burlap is also commendable because it conserves cotton of which there has been an increasing shortage of supply for the past few seasons.

Manufacturing Processes

Manufacture of the styles of automobile topping mentioned includes rubber mixing, calendering, spreading, vulcanization and



American Tool & Machine Co.

American Type Spreading Machine

their attendant preparatory processes and control. The rubber work is preceded by careful preparation of the fabrics, such as inspecting, dyeing, drying, napping, etc., followed by pyroxylin surface coating upon the single or double texture goods.

Like every volume production proposition the manufacture of automobile topping requires well studied factory arrangement and equipment in the operation of which the processes are coordinated for continuous production and the results fully controlled.

The rubber departments of a topping plant comprise the usual equipment needed for compounding, mixing, calendering, cement making, spreading, doubling, graining and curing.

Automobile topping as a volume production proposition employing plastic stocks relatively few in number utilizes very advantageously rubber compounding by enclosed mixers. The rubber mixings whether for calender coating or spreading are intended to be vulcanized by dry heat cure. The range of ingredients includes plantation smoked sheets, reclaimed rubber, litharge, sulphur, whiting and various softeners. Accelerators are not generally used in topping stocks.

Mixing Stocks

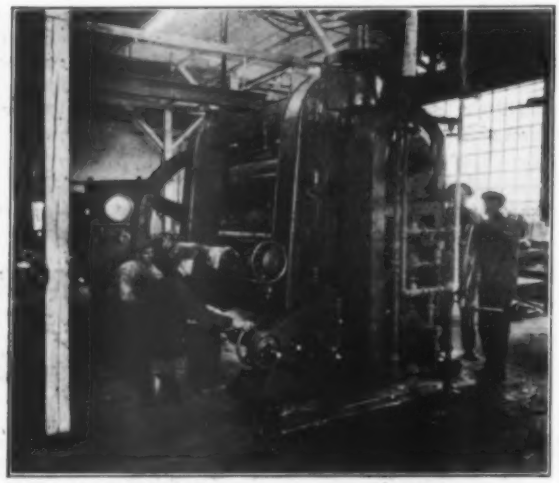
Stocks are mixed in enclosed mixers, into which the batch ingredients are fed from the raised platform, reached by the stairway shown in the right of the picture. From the bottom of the mixers the compounding stock is discharged into metal box trucks, conveyed across the room and batched into convenient sheets by a line of mills.

Cement Making

A so-called anchor coating of rubber cement is applied to all fabrics previous to calender coating them in order to insure good attachment of the latter, the better to unite doubled plies. Cement for this purpose and spread coating generally are made in a special room equipped with a double line of power driven mixers or cement churns.

Rubber Spreading

The ordinary American type spreader is employed for applying successive light coatings of cement to build up the desired thickness of rubber between doubled plies. Precautions are observed to eliminate fires from discharges of static electricity and the machines are speeded consistent with the production of good work.



Wellman-Seaver-Morgan Co.

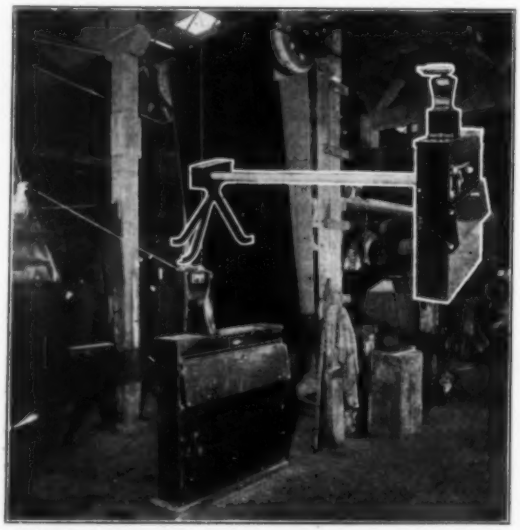
Three-Roll Skimming Calender

Calendering

Skim coating the face fabric of topping is done in a heavy, three-roll calender. The skim coat of rubber is applied upon an anchor spread coat of better stock to insure firm adhesion of the calendered coating. The latter serves as the pliable outer waterproof coat and by its plasticity and curing quality serves perfectly to receive and retain the leather grain applied by the embossing calender.

Automatic Weight Control

Control of uniformity of calender coating is effected by continuous automatic weighing of the coated fabric as it leaves the calender. For this purpose an automatic continuous weighing scale is used. It is shown arranged in working position on the delivery side of a topping calender. The scale gives a continual indication of the weight of a lineal unit of sheet material, while in the process of coating. It permits adjustment of the calender so as to deliver material of a desired weight per lineal unit.



Toledo Scale Co.

Weighing Calendered Fabric. Insert—Enlarged View of Weighing Unit

It is adapted to the manufacture of practically all kinds of flexible material produced in continuous moving sheets of definite width.

The scale is placed in the line of the moving material as it passes from the calender and gives notice to the operator of any variation in the weight of the material being produced, thus permitting him to make promptly the adjustments necessary to produce material of the desired weight. As the material passes over the scale the position of the indicator clearly shows every variation in the weight, per unit of length, from the desired standard. The tolerance or variation from standard allowed on a 60-inch topping fabric is a quarter ounce plus or minus.

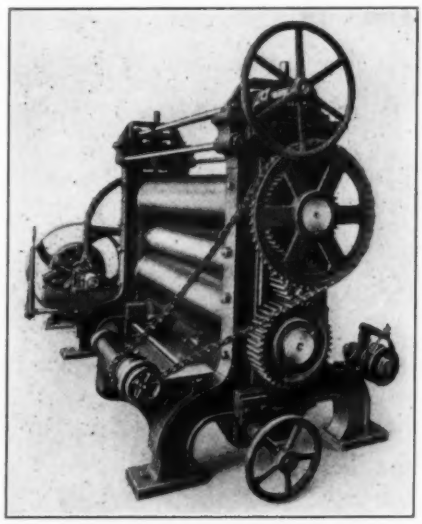
Pyroxylin Surfacing

Doubling plies for double texture topping is done in the ordinary two-roll doubling calender. Following this operation the goods are surfaced with a luster coating of pyroxylin applied as a liquid in the machine. The action of this machine is different from the ordinary rubber spreader. The coating is regulated by tension of the fabric passing under a square edge knife bar placed so as to form a valley in the fabric. The valley serves as a reservoir to contain the pyroxylin liquid as the fabric passes under the spreader knife.

Embossing the Grain

The application of embossed leather grain to rubber surfaced topping is effected by passing it through a roll embosser or special calender. The grain effect is engraved on the face of the middle or steel roll which impresses the reverse of the grain into the surface of a roll made up of compressed disks of paper. The

grain is embossed on the rubber surface as the fabric passes under heavy pressure between the steel and the paper rolls. Incidentally, embossing practically doubles the strength of the grip of the rubber attachment of the plies.



Textile Finishing Machinery Co.

Embossing Calender

Vulcanization

Vulcanization of topping, like that of all hot cured coated or proofed fabrics, takes place in large chambers into which the goods are drawn and draped by power machines. Heat for curing is derived by radiation from floor coils. Regulation of the curing temperature and time are under automatic control and are autographically recorded. Ordinarily one hour is allowed to raise the vulcanizing chamber to curing heat, 252 degrees F., and the cure is effected in another hour at that temperature.

HAND LANTERN FOR RUBBER FACTORIES

The electric hand lantern, here illustrated, is made vapor proof and therefore safe and convenient for use wherever combustible vapor, gas or dust is present. It has a swinging bail, a watertight cord outlet with reinforcement to prevent chafing of the cord, and a watertight operating handle for key receptacle. The globe permits the use of any lamp up to and including 75 watts. The guard and globe can easily be removed for replacing lamps. The base gives the lantern substantial support when placed upon the floor or ground. The body is aluminum, and the guard including base is brass, galvanized finished.—Crouse-Hinds Co., Syracuse, New York.

Vaporproof Electric Hand Lantern

U. S. CRUDE RUBBER IMPORTS INCREASE IN APRIL

United States imports of crude rubber were estimated for April, 1924, at 85,042,981 pounds, value $20,531,821, as compared with only 46,434,476 pounds, value $11,638,062 for the month previous, the figures for April, 1923, being 69,446,775 pounds, value $21,876,398. Totals respectively for January and February of the present year were, 49,080,330 pounds, value $12,066,929; and 70,588,695 pounds, value $17,644,164. Estimates for the corresponding first two months of 1923 were: 79,763,620 pounds, value $14,310,825; and 60,379,290 pounds, value $13,150,823.

American Controlled Crude Rubber

Reports have been submitted by Commerce Department investigators who have just returned from explorations and surveys in the Far Eastern and American tropics. These summaries, which later are to be supplemented by separate reports, include the following general statement:

"The total area planted in the East was found to be about 4,266,000 acres, of which 2,729,000 acres are owned by European and American capital and 1,537,000 acres by Asiatics. About 3,500,000 acres are producing or old enough to be tapped. Through domicile of plantations in British territory, and through ownership of plantations by British capital in other territory, Great Britain controls 77 per cent of the total area under rubber. American capital invested in the East is estimated at only $32,000,000 against $489,000,000 for Great Britain; $130,000,000 for Holland; $40,000,000 for Japan; $27,000,000 for France and Belgium; and $47,000,000 for other European countries.

"The Commerce Department investigators believe that the operation of the British restriction laws, adopted in November, 1922, will probably reduce the aggregate potential output for the years 1924, 1925, and 1926 by upward of 200,000 tons of rubber. Rubber planted by the native population and old areas on European estates, which have not been properly cared for, are expected to show declining yields in the future."

Ample land and labor are available for new planting in Malaya, Sumatra, and Indo-China, but India and Burma are not attractive because of unfavorable climatic conditions. There is also very little desirable unoccupied rubber land left in Java and Ceylon, while taxation is also a serious drawback to further investment in Netherlands Indies. Present and proposed corporation laws might prove a hindrance to American capital in Indo-China. British North Borneo, however, has a promising future.

Concerning the Philippines, the expressed opinion is that the dangers of typhoons and lack of labor supplies, two deterrent factors stressed in previous reports, have been exaggerated. The uncertainty of the present political situation and the reported lack of encouragement toward the introduction of large American or other investments are outstanding factors which militate against rubber developments in the islands. Topography, soil and climatic conditions were found favorable in the islands of Mindanao, Basilan, and Jolo, and more than 1,500,000 acres in the Philippines might be utilized.

Other countries visited included Guatemala, Salvador, Nicaragua, Costa Rica, Panama, Colombia and Ecuador. Information was also gathered on western Venezuela and southern Mexico. Physical conditions suitable for rubber cultivation were found in portions of Guatemala, Honduras, Nicaragua, Costa Rica, Colombia, and Ecuador. It should be carefully noted, however, that this commendation does not necessarily apply to certain important factors regarding labor, taxation and legislation, which in some cases present formidable obstacles. Conditions are regarded as least suitable, due to definite dry seasons, in southwestern Mexico: southern Guatemala; western Costa Rica; southern Panama west of the Canal; and certain arid regions on the coast of Ecuador.

The important conclusion reached by the investigators was that the aggregate area of desirable land in tropical America is sufficient for the development of rubber plantations to rival the present cultivated areas in the East. It was also found that, in general, taxes on land are either non-existent or inconsiderable, and that land tenure conditions varied greatly. Before plantation projects can be considered for these regions of practically unlimited area in the Philippines and South and Central America, the unfavorable economic and legislative factors must be carefully reviewed. Difficulties are many, but the prospect in general is promising.

APPROXIMATELY 20,000,000 TIRES WERE PRODUCED IN THE UNITED States during 1916, the figures rising to 47,000,000 for 1923.

Rotogravure Printing on Rubber[1]

Rotogravure Process—Preparing the Picture—Etching the Printing Roller—Rotogravure Printing—Rotogravure on Rubber

PRINTING upon rubber surfaces can be done by type, lithography, or rotogravure. The reproductions of photographs familiar in weekly pictorial sections of newspapers exemplify printing by the rotogravure process. The advantage of rotogravure printing is that lights and shadows are reproduced with photographic effect.

The preparatory details required are such as can be carried forward with the speed essential to the production of modern newspapers. The ink used is inexpensive and fluid, both in marked contrast to the heavier oil-base printing inks employed in ordinary printing and lithography.

Methods of Printing

There are only three known methods of producing printed impressions. The first is by contact of inked type or other raised inked surfaces upon paper resulting in printing an impression.

The second method is by lithography, a system of offsetting or transferring the design from a specially prepared stone, metal surface or rubber surface,—those areas which are to print having been made absorptive to ink and repellent to water, and those which are not to print made the reverse in order not to take the ink.

The third method is that used in rotogravure. The design in this system is intaglio, or etched into the printing surface of a copper roll. The etching is filled with fluid ink, the excess of which upon the surface is removed and impression of the design is made by bringing it into contact with the paper under pressure, which when the ink is withdrawn from the etching produces a print of the design.

Until recently the latter style of printing had not been attempted upon rubber but since it has been demonstrated commercially possible a brief account of the rotogravure process has timely interest. The method is of German origin transferred to and developed in America. It is rapidly gaining in popularity because of the artistic possibilities it affords at moderate expense.

Preparing the Picture

Rotogravure printing is worked from a photographic positive instead of a negative as in ordinary photo-engraving. The process from photograph of subject to rotogravure print comprises the following steps:

(1) Photographing the subject. (2) Printing a positive on glass or celluloid. (3) Retouching the positive print. (4) Mounting retouched prints on layout table illumined from below. (5) Sensitizing and squeezing carbon tissue onto ferrotype sheet. Carbon tissue is a film of gelatin applied to paper. It is sensitized by treatment with ammonium bichromate. (6) Drying squeezed carbon tissue sheets in revolving rack. (7) Printing photographically the "layout" onto the sensitized carbon tissue film. This is done in a vacuum printing frame to secure perfect contact between the negative and the film to insure sharpness in the print. (8) The carbon tissue prints are transferred to the polished copper printing roller by roller squeezing. The print is photographically developed in hot water and the paper backing of the carbon tissue removed. (9) Staging or painting out on the copper roller preparatory to etching the roller. All parts of the layout and cylinder that are not to appear in the rotogravure print are painted out with asphaltum that will resist the etching medium.

The printing cylinder of the rotogravure press consists of a cast iron roller mounted and trued on a shaft. Upon its surface copper is deposited electrolytically to the thickness of about a quarter of an inch. This requires continuous plating for three weeks. When completed the coppered roller is turned to size in a lathe, trued in a grinding machine and polished to a high surface with a water of Ayre stone and finest emery paper. Thus prepared the roller is ready to receive the layout of pictures or designs to be printed.

Etching the Printing Roller

The transfer of carbon tissue prints having been accomplished as indicated above, the printing roller is etched by perchloride of iron solution poured over the roll for 10 to 15 minutes. This solution is prepared of six different strengths, all of which are used progressively, beginning the etching with the strongest and finishing with the weakest solution when mild effect is essential.

The etching of one job is ground off the copper surface preparatory to the substitution of that for the next. In this way a roller prepared as described is good for 40 to 50 etchings before it requires renewal of the copper surface.

Rotogravure Printing

In the illustration of a rotogravure press the etched copper printing roller is shown revolving in a tray of ink. The excess of ink brought up on the roll is removed by a flexible spring steel scraper or knife 0.013 inch thick which scrapes the roll clean of ink except in the "screen" of the engraving, which holds sufficient ink for the impression. The excess ink flows back into the ink fountain. To receive the impression the paper passes over the gear driven etched roller and at that point is compressed from above by a firm rubber impression roller. Under this compression the paper pulls the ink out of the etched surface and thus the impression is obtained.

After printing, the paper passes upward over rollers to a steam drying drum and is rewound or continues through a second printing unit for an impression on the opposite side.

Rotogravure on Rubber

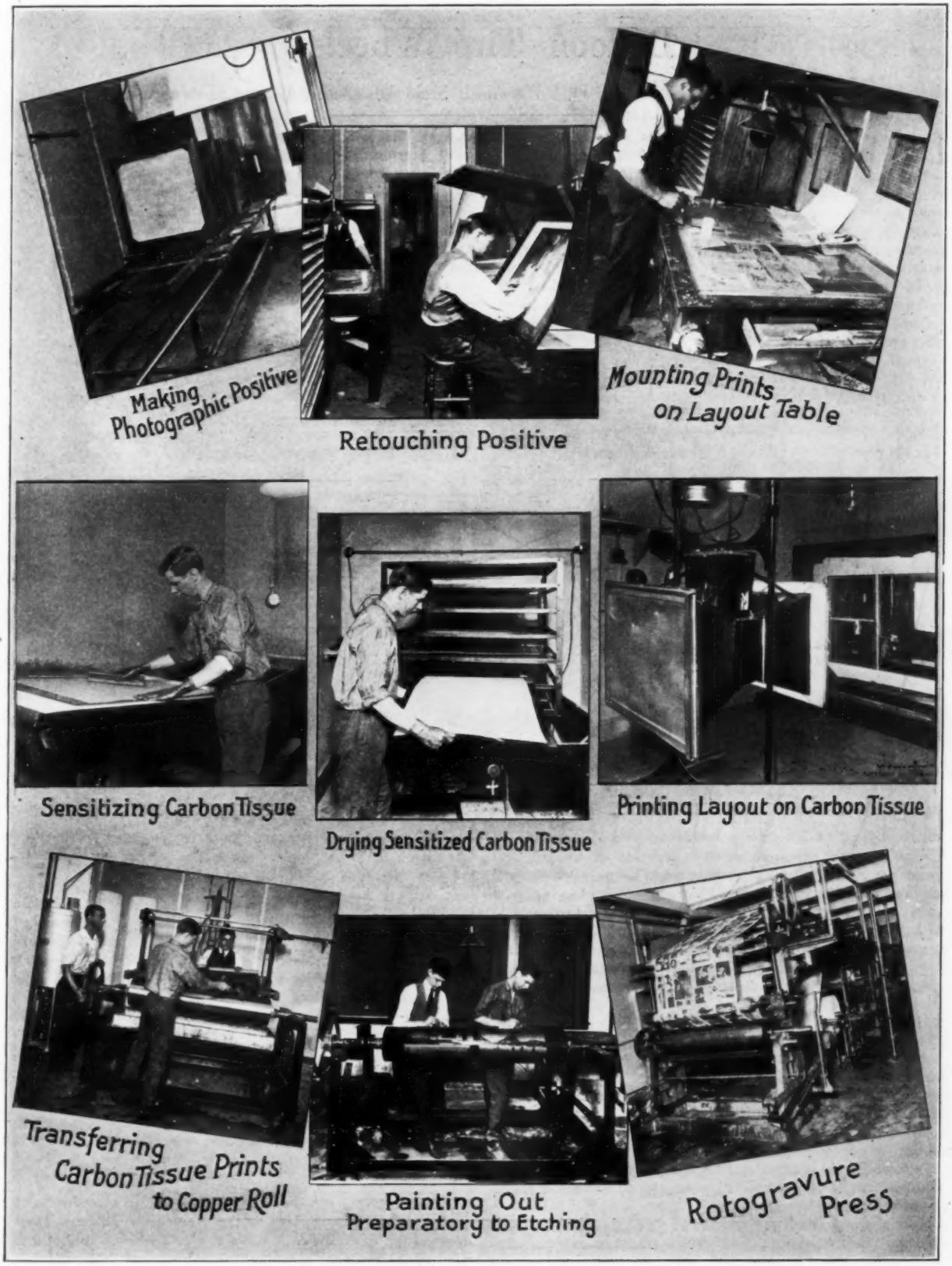
Rotogravure printing can be done on rubber or rubberized fabric surfaces with the same artistic effect possible upon paper. It may be done in one or in two colors, in rolls or in sheets. The range of artistic and pictorial effects in photographic style are without limit and inexpensive. Single or multicolored effects by rotogravure process are equal to those by type, halftone or lithographic printing and impressions can be run off at good speed.

Industrial Applications on Rubber

One practical application is the reproduction of cretonne floral effects and other designs on rubberized fabric to be employed in the form of weatherproofs on surface or linings, and washable slip covers for porch furniture and similar uses.

Sheets of rubber supported on paper for feeding can be printed with designs for bathing caps, bags and other articles. In this case a flat bed rotogravure press is required. Other applications of rotogravure printing on rubber will doubtless follow as its practicability is demonstrated commercially. In rotogravure single tone effects are the rule but color effects are equally practical.

[1] Data and illustrations from The Bidart Machinery Corp., New York, N. Y.


Making Photographic Positive
Retouching Positive
Mounting Prints on Layout Table
Sensitizing Carbon Tissue
Drying Sensitized Carbon Tissue
Printing Layout on Carbon Tissue
Transferring Carbon Tissue Prints to Copper Roll
Painting Out Preparatory to Etching
Rotogravure Press

Balloon Tire Wheels

Typical Wheels of Wood, Disk-Plywood, Steel Disk, and Wire Construction

THE introduction of balloon tire equipment necessarily involves wheel changes to accommodate them and also new departures in design and construction. In this latest development of the tire industry the wheel and tire companies have worked and experimented in close cooperation to perfect wheels to meet all the requirements of the new riding conditions. Wood wheels have become somewhat less practical because balloon tire wheel diameters are not sufficient to allow the heavy felloe necessary for wood construction. Not only must a felloe be unnecessary on a satisfactory small diameter wheel but the clearance about the brake levers must be more than ordinary. Light weight and maximum heat radiating ability are also desirable.

Typical balloon tire wheels representing leading makes in wood, steel disk, disk wood and wire construction are here illustrated, and their principal features indicated.

Wood Wheels

For the popular small cars using 3½-inch standard high pressure tires the 4.40-inch balloon tire is substituted on a 21-inch rim. In order to lessen the expense involved in the wheel change, provision is made for utilizing the original wood wheel hub parts, flanges and hub caps, as in the Hayes wheel. The change-over is effected by removal of these parts from the old wheel and bolting them into the balloon type. Such wheels are demountable at the rim by means of a lug type rim. The lugs, in addition to keeping the rim well alined, eliminate squeaks and act as driving members, distributing the strains around the wheel circumference.

Disk Wheels

Balloon tire disk wheels present a particularly neat and sturdy appearance and have marked practical advantages. They offer sufficient resiliency and withstand road service with essentially no danger of getting out of alinement. The depth of curvature of the disk provides for outside extension of the valve stem and produces a very pleasing contour in combination with the curvature of the tire.

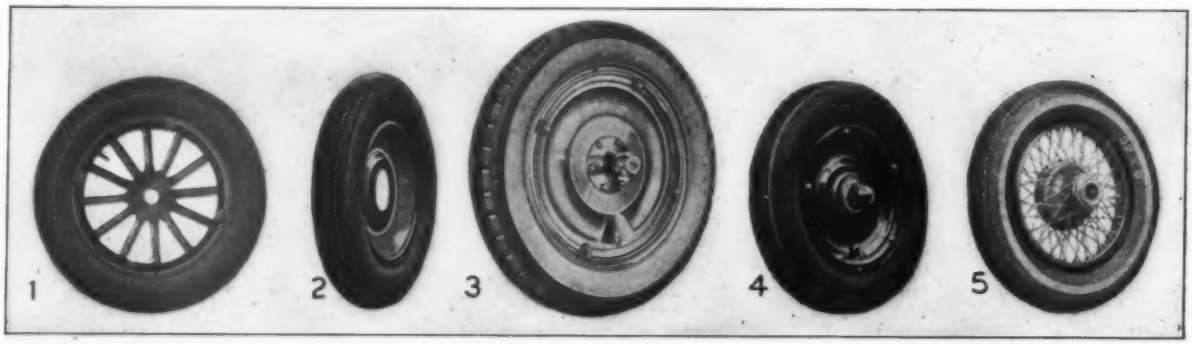
Disk wheels are produced in steel and plywood. The disk-wood wheel is built of plywood for lightness and resilience and shaped in dished form for strength.

Most plywood wheels are entirely of plywood, united by casein glue while under pressure, while others are of alternate plies of wood veneer and rubberized duck united by vulcanization under pressure. Their concave formation is secured either by shaping under pressure or by lathe turning the curves, subsequently facing the turned surface with a pair of crossed plies of veneer as a protective and finishing cover to the otherwise exposed plywood edges.

The Mengel plywood wheel is of this construction, practically on the style of an aeroplane propeller. Veneer construction means great resiliency and produces wheels that will not dish under heavy side impacts. They spring back to shape, run true and do not rumble when in service.

Steel disk wheels, of which the "Tuarc" is typical, are considered ideal for the motorist who changes from wood to steel wheels for low air pressure tires. These are made of tough, resilient steel with disks practically indestructible. The demountable rims are removed easily when tire changes are necessary. In changing from wood wheel equipment to this style the wood wheel hubs and drums are used, making a very simple installation.

A second all steel disk wheel, known as the "Disteel" is designed for the use on the better and heavier automobiles taking large size tires.



(1) Hayes Wheel Co. (2) "Disteel," Motor Wheel Corp. (3) "Diskwood," Dayton Automotive Wheel Co. (4) "Tuarc," Motor Wheel Corp. (5) "Ash," American Car & Foundry Co.

Wire Wheels

Clean cut, light-weight appearance is characteristic of wire wheels for balloon tires, because of the design of the hub shell which covers the unsightly driving studs. The clearance for brake levers and connections is greater than in wheels of other types. The all-metal construction transmits the frictional heat away from the tire efficiently and the spokes radiate it. This fact combined with the inherent resiliency are the outstanding features of balloon tire wire wheels.

ENGLAND'S PURCHASES OF AMERICAN-MADE SOLID TIRES FOR automobiles and trucks have reached, during the first two months only of the present year, a value of $206,468, as compared with only $188,146, the total for the entire year 1922.

A CONTRACT CALLING FOR $1,500,000 OF RAILWAY ELECTRIFICATION equipment has been received by the Westinghouse Electric International Co. from Takata & Co., acting as agents for the Imperial Government Railways of Japan.

The Question of Exclusive Tire Sales Territory

Fundamental Facts—Exclusive Tire Dealers' Position—Advantages of More Than One Dealer—Tire Manufacturer Profits by Broad Representation

By H. P. Wilkin

SHOULD the tire dealer be given exclusive territory? Many dealers—perhaps a majority—think that they should. A few manufacturers agree with them, but there are many who do not. In this matter the desires of the consumer are not consulted, and unless he gets consideration the business will not grow.

Fundamental Facts

A correct answer to this question is to be found in the fundamental facts. One of first importance is that tires are a staple necessity. Cars cannot run on bare rims and the best tires will wear out. So the consumption of tires bears a fairly constant ratio to the number of automobiles in use. It varies with the nature of the roads in different localities and with the greater or less mileage that cars are run in different communities.

Another fundamental fact is that sales of a staple article grow in proportion to its accessibility. There must be general distribution before sales can reach a large volume. This does not mean that it must be sold all over the country, but wherever marketed it should be available in the largest number of places. The car owner does not buy his supplies at one place, but at any convenient station. He may have a puncture or blowout at any time and place and his spare may be of very doubtful strength. Why, then, should he have to seek out one store in town, perhaps many blocks distant, to buy the brand of tire he prefers? Is that good service which will increase the sale of that tire?

Exclusive Territory Proposition

The tire dealer's demand for exclusive territory is based on the idea that there is only a certain amount of business on one make of tires in a given town. He assumes, if it is a town of, say, 10,000 population or less, that he should handle all the business there. Now there are likely to be 1,000 to 2,000 cars in the town and nearly as many more in the tributary rural territory. All of these will consume, on an average, 2½ tires and as many tubes each per year. The total sales probabilities are from 3,750 to 5,000 tires and about 4,000 to 5,500 tubes. According to the dealer, there will be a market for only 200 to 300 tires and tubes of one particular brand which he handles and if there is more than one dealer stocking these there will not be enough business for both.

In the first place his position is untenable unless he agrees not to sell any other make and to push the one particular brand. This is very doubtful policy for him unless the manufacturer makes several grades and the brands are very popular; otherwise he would automatically shut off a big majority of the tire buyers in town. Even if he is agreeable to handling one make exclusively his reasoning is wrong because, as a matter of fact, he cannot know what the sales possibilities of any one brand are in his town. That is solely a matter of creating demand which this year may be for only one tire in every twenty bought for local cars; but there is no insurmountable obstacle to raising the ratio to one in ten. Furthermore, during the summer a live dealer can secure a considerable volume of tourist tire trade on any well-known make that he carries. Although some car owners prefer uniform tire equipment all around, there is so little difference in the serviceability of tires in any price class that a majority of motorists can be induced by the dealer to take a tire different from those on his car.

The only absolute limit to the number of tires that can be sold by any dealer is the total number of tires that will be required by all local owners, tourists, and others driving into or through the town. No one dealer can reasonably hope to get all this trade but he can get more of it if he handles two or three makes than if he carries only one; and conversely, more tires of any one make can be sold if several dealers carry them than if one dealer has exclusive rights in the town. If only one dealer handles the line, he has an almost impossible task to convince the car public that his tires are superior to all the others carried by other dealers in his town. His sales are not likely to grow much if any faster than the car registrations.

Advantages of More Than One Dealer

On the other hand, if two or three dealers handle the same tires, display them in their windows and advertise them with store and road signs, even though they also sell other makes, the public is pretty sure to become convinced that the advertised tires are good ones as so many dealers are pushing them. If the tires really are of excellent quality they will become popular in the town and the leaders in sales. So the volume of sales will double or treble and each dealer will get as much business as if he alone handled the brand and will find it easier and cheaper to make sales. It will be largely a matter of handing out what customers ask for instead of trying to sell them something else.

Suppose, on the other hand, that a dozen dealers are handling as many different makes exclusively. No one make has any preeminence, each dealer claims his is best, and each has to put a lot of selling effort behind it to offset the competition. The public concludes there is little choice between them and shops around to see which can be bought at the best price.

It is sometimes argued that if several dealers handle one make in the same town it will lead to price cutting. This is fallacious, for there is less probability of price cutting on a popular tire than on the less popular ones. The worst price cutting is not in the best class of tires but in unknown brands that must depend for sales entirely on price advantage. The dealer who has the sole agency in the town for one make will find it just as hard to resist "gypping" on other brands as he will to meet price cutting by another dealer handling the same make as himself. A dealer can make more sales and larger profits on a tire that is in greatest demand, even though other dealers are handling it, than he can make on a tire that is not popular but for which he has exclusive territory.

Tires, together with various other automobile accessories and supplies, differ from most other products in the fact that they are not consumed in one place by the purchaser. The car owner may travel across the continent and back in a season, passing through perhaps half the states in the Union. He has his preference in tires, spark plugs, grease, oil, gasoline, and so on. Hence each tire maker seeks the widest possible distribution of his product. There is no necessity for this, however, and it is a dissipation of effort that reduces profits. It would be easier and would cost less for the smaller manufacturer to confine himself to intensive development of sales in his own part of the country, extending the area gradually. That would enable him to get good distribution in his own territory and to build up a reputation among resident consumers. There is about as much business sagacity in a tire manufacturer who has a capacity of 1/100 of the total tire production of the country trying to spread his output over forty-eight states as there would be in a tire dealer trying to carry a stock of all the different tires manufactured. Either is more than likely to go broke in the attempt.

Broad Representation Best for Tire Manufacturer

A manufacturer has little to gain and much to lose by making a territorial commitment with a dealer. Unless the dealer will handle the one make exclusively, the manufacturer can get only his divided interest. If, then, the dealer finds that one of his other lines sells easier or he can make a better profit on it, the first maker will find his sales slipping in the territory. Then, if he complains that sales are not developing as he thinks they should, the dealer is likely to threaten to throw out the line. So the manufacturer is at the mercy of the dealer and must make all sorts of unreasonable concessions or find another dealer and start building up sales again.

Even if the dealer handles no other make of tire, the manufacturer is equally dependent on him, for the dealer might fail, sell out, or become disgruntled and switch to another make. There is only one largest and best dealer in a town and only one manufacturer can secure him as an exclusive representative. Then all other makers must tie up with poorer representation. And the one manufacturer cannot get the one best dealer in every town. Again, it is rare that any one dealer commands the trade of a majority of the car owners of his town or county. There are always a considerable number of persons who prefer to buy elsewhere. So, if the manufacturer gives one dealer the territory exclusively, he automatically cuts off a certain percentage of sales possibilities.

It may be argued that no one manufacturer hopes to do all of the tire business in any town or county and that it would be impossible for him to get even half of it. The same would have been said of Henry Ford ten years ago, yet today he sells half of the cars sold in the whole country. It will be noted, too, that in cities of any size he has more than one dealer. True, they are assigned certain districts but the areas are small and the car gets very wide distribution. Now, for an article that a man buys only once in several years and that costs $300 or more, the buyer would not greatly mind seeking out a single dealer in any part of any but the very largest cities. One dealer, therefore, could serve the needs of the whole city if he were conveniently located near the business center, except in New York or Chicago, where there are natural physical territorial divisions. Yet, by having numerous dealers, the sales of the Ford car have been built up to a great magnitude, the manufacturer is not dependent on any one dealer in the city, and all the dealers do a profitable volume of business without having a sales monopoly. The Ford eggs are not all carried in one basket.

That policy is even more logical with tires, which every car owner buys two or three times a year and which cost only a few dollars each. He wants to get them quickly and with the least effort, and it is to the manufacturer's interest to see that he gets the kind of service he wants. In the final analysis, the matter resolves itself down to service to the consumer, and the tire that has the best distribution—that is available in the largest number of places in any given area—is certain to be the one whose sales will increase fastest, provided quality and price are on a parity with other makes sold in the same territory.

SCHRADER ORGANIZATION'S EIGHTIETH BIRTHDAY

In celebrating the eightieth anniversary of the founding of its organization, A. Schrader's Son, Inc., maker of pneumatic valves, has planned an effective window display, arranged at the Schrader plant, Atlantic and Vanderbilt avenues, Brooklyn, New York. A central placard announces that when in 1844 August Schrader, founder of the business, established his offices, President Tyler rode through the streets of New York City in a horse-drawn carriage. The display contrasts the carriage with the automobile of today, and shows the part the Schrader organization has taken in the development of the automobile, and particularly in the tire industry.

April Exports of Rubber Goods Increase

April has set a new high record for values of several lines of rubber goods exported from the United States, due to better prices for casings, with increasing shipments of such goods, but particularly to unusually large exportations of mechanical rubber goods and soles and heels. The total value of all rubber goods exported during April is estimated at $3,412,170, continuing the steady rise since the beginning of the year, the January figure being $2,709,319; February, $3,037,840; and March, $3,365,709.

April exports of rubber hose, 446,767 pounds, value $166,097, and exports of rubber packing, 195,909 pounds, value $83,561, set a new record for such goods. Rubber belting exports, at 342,331 pounds, value $212,174, represented another unusually large shipment, exceeded only in May, 1923, when the total was 385,175 pounds. Leading customers in April, and their total importations of all three lines of goods were as follows: British South Africa, $62,396; England, $59,252; Japan, $53,584; Mexico, $39,001; Chile, $25,808; and Australia, $22,083.

During April, 113,135 automobile tires were exported, the average unit value being $12.40, as compared with 102,240 casings, at a unit value of $11.29 in March. There was little change in the value of solid tires, but the value per tube in April, at $2.01 was 35 cents higher than in March. Although tire exports during the early months of 1924 show a decline in volume as compared with the corresponding months of 1923, there has been a continued improvement since the first of the year. While there has been the usual dull seasonal period in exports of rubber footwear, the trade in rubber specialties has been good, and there have been promising markets for bathing caps, as well as for rubber toys and balloons.

Canvas rubber-soled shoes are being exported from the United States to a much less extent this year than last, important shipments being made by one American firm from its Canadian factories. There has been a steady growth, however, during 1924 in exports of rubber soles and heels, the April exports amounting to 235,891 pounds, value $72,068, a new monthly record for this class of goods, the previous high figure being 221,845 pounds in March, 1924.—*Commerce Reports.*

INCREASE IN AMERICAN TIRE IMPORTS

United States importations of rubber tires, especially from France, have increased rapidly during the first quarter of the present year. While a certain share of these French importations represent solid tires, and casings and tubes for automobiles, motor cycles and bicycles, it is believed that the greater part are clincher balloon casings, size 31 by 4.4, and of inner tubes for these.

AMERICAN TIRE IMPORTATIONS

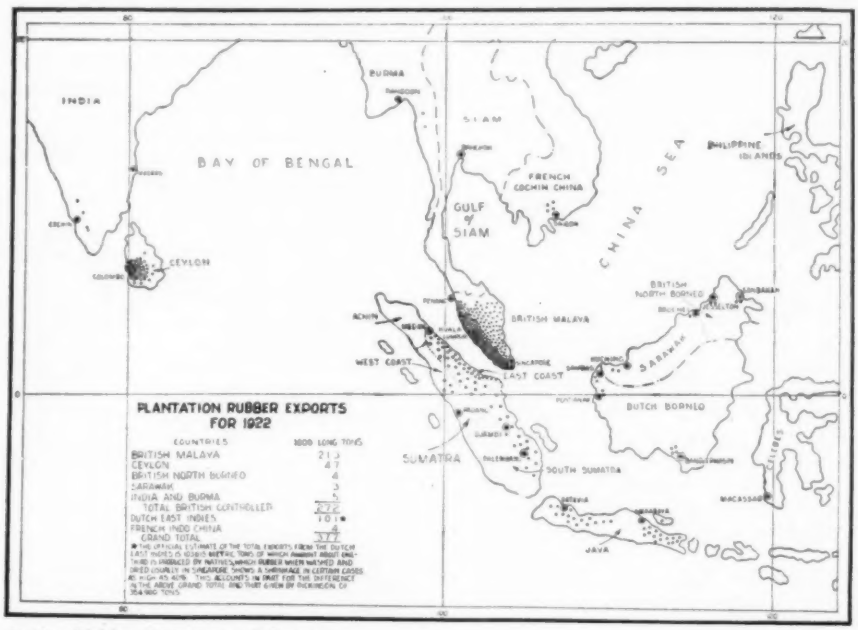
1923	Number	Value
First quarter	289	$3,399
Second quarter	5,690	25,147
Third quarter	2,382	37,943
Fourth quarter	818	7,528
1924		
First quarter	76,139	383,718
April	26,100	165,063

Detailed statistics show that during the first four months of 1924 France has exported to the United States 101,852 tires, value $543,838; Canada's share for this period is 206 tires, value $2,921; while England has sent 181 casings, value $2,022.—*Department of Commerce.*

THE WORLD'S CONSUMPTION OF CRUDE RUBBER IN 1923 HAS BEEN estimated by F. R. Henderson & Co., 250 West 57th street, New York, N. Y., at approximately 434,000 tons, the chief consumers being the United States, 304,000 tons; France, 30,000 tons; the United Kingdom, 27,000 tons; Germany, 20,000 tons; Canada, 14,000 tons; Japan, 11,000 tons; Italy, 9,000 tons; and other countries, 19,000 tons.

The World's Production and Consumption of Crude Rubber[1]

CRUDE rubber comes from two general sources: (1) Several species of plants growing wild in different parts of the tropics, and (2) planted crops of one species that has been introduced principally into the tropical Far East, that is, southeastern Asia and certain neighboring islands. This latter species is *Hevea brasiliensis*, which is also the principal wild species, indigenous only to the Amazon Valley and producing most of the wild rubber of commerce. The product of the wild species is known as "Pará rubber." In distinction from this, the cultivated Pará rubber is known as "Plantation Pará," "Plantation Hevea," or simply "Plantation," and, when referring to the grades, as "Plantations."



Rubber Division, Department of Commerce

Far Eastern Rubber Plantations. Each Dot Represents 1,000 Long Tons of Rubber Exported in 1922

From the time when rubber reached the markets of the world in any great quantities the United States has been the leading importer of it. Table I shows the world's production and the position of the United States as the leading consumer; it also shows the position the United States has held in this respect: that in 1900 the United States imported 41 per cent of the world's production. From that time on there has been a steady increase in the United States proportion of imports, until in 1923 77 per cent of the production reached this country. Comparatively little of this amount was exported and in late years the reexports were a very small fraction of the total imports.

The principal secondary ports where rubber is received for consumption or redistribution are London, Liverpool and New York. The standing of London is shown by Table II. This table shows that in 1907 the imports into the United Kingdom were 48 per cent of the world's production, whereas in 1922 they were only 16 per cent of this production. A comparison of this table with the import figures into the United States will show that up to 1915, with the exception of two years, the imports into

Table I. World's Production of Rubber; Quantity and Value of United States Imports and Reexports of Rubber, 1900 to 1923

	World's Production				Imports into the United States			Reexports from United States	Retained in United States
Year	Plantation Long Tons	Brazil Long Tons	Other Long Tons	Total Long Tons	Amount Long Tons	Per Cent of Total	Value	Long Tons	Long Tons
1900	4	26,750	27,136	53,890	22,026	41	$28,577,789	1,718	20,308
1901	5	30,300	24,545	54,850	25,064	46	28,120,218	1,663	23,401
1902	8	28,700	23,632	52,340	22,701	43	25,158,591	1,456	22,245
1903	21	31,100	24,829	55,950	24,886	44	35,152,642	1,646	23,240
1904	43	30,000	32,077	62,120	27,629	44	43,784,297	1,540	26,089
1905	145	35,000	27,000	62,145	28,637	46	48,517,906	1,616	27,021
1906	510	36,000	29,700	66,210	30,316	46	53,391,137	1,698	28,618
1907	1,000	38,000	30,000	69,000	30,649	44	49,813,361	1,832	28,817
1908	1,800	39,000	24,600	65,400	34,058	52	44,696,526	1,655	32,403
1909	3,600	42,000	24,000	69,600	41,950	60	79,264,817	2,156	39,794
1910	8,200	40,800	21,500	70,500	45,038	64	103,673,746	2,764	42,274
1911	14,419	37,730	23,000	75,149	36,987	49	74,410,550	2,523	34,464
1912	28,518	42,410	28,000	98,928	52,705	53	99,567,071	2,456	50,249
1913	47,618	39,370	21,452	108,440	51,732	49	76,820,739	1,881	50,852
1914	71,380	37,000	12,000	126,380	63,868	53	70,472,704	2,618	61,250
1915	107,867	37,220	13,615	158,702	98,876	62	111,031,144	2,082	96,794
1916	152,650	36,500	12,448	201,598	120,576	60	159,745,475	4,098	116,478
1917	213,070	39,370	13,258	265,698	181,089	68	233,220,904	4,000	177,089
1918	255,950	30,700	9,929	296,579	145,518	49	146,278,313	2,746	142,772
1919	285,225	34,285	7,350	326,860	239,259	73	215,820,113	2,282	236,977
1920	304,816	30,790	8,125	343,731	252,922	74	242,795,773	4,160	248,762
1921	271,233	19,837	2,890	293,960	185,394	63	73,772,677	5,716	179,678
1922	[2]378,232	21,735	3,205	403,172	301,076	75	101,843,188	4,809	296,267
1923	[3]375,415	21,000	3,000	399,415	309,139	77	185,057,719	8,774	300,365

NOTE.—The figures of production are taken from "The World's Rubber Position," published by W. H. Rickinson & Son; the import and export figures are the official ones of the United States Government.

[1] From Trade Information Bulletin No. 180, Rubber Division, United States Department of Commerce, entitled "Marketing of Plantation Rubber," by J. J. Blandin, special agent. This is the first report of the Crude Rubber Survey authorized by the Sixty-seventh Congress and prepared under the direction of H. N. Whitford, chief of the Crude Rubber Section.

[2] This figure is subject to revision depending on final official figures of outlying regions of the Dutch East Indies.

[3] Estimated.

Table II. Imports, Exports, and Amount of Rubber Retained in United Kingdom, 1907 to 1922

Year	Imports *Long tons*	Per cent of total production	Exports *Long tons*	Exports to United States *Long tons*	Amount retained *Long tons*
1907	33,364	48	17,451	4,418	15,913
1908	28,753	44	17,925	3,040	10,828
1909	35,003	50	19,896	5,726	15,107
1910	43,848	62	23,393	6,945	20,455
1911	45,297	60	28,561	7,122	16,736
1912	55,023	56	36,299	13,272	18,724
1913	70,287	65	45,011	15,252	25,276
1914	67,623	56	49,074	21,553	18,549
1915	78,592	50	63,520	33,557	15,072
1916	75,218	38	48,458	32,348	26,760
1917	78,420	30	52,437	31,905	25,983
1918	46,904	16	16,800	2,959	30,104
1919	101,891	31	59,371	26,898	42,520
1920	110,878	32	53,905	33,615	56,972
1921[1]	84,960	29	42,873	20,504	42,087
1922[1]	63,917	16	52,152	22,516	11,765
1923[1]	80,163	20	67,605	30,710	12,558

[1] Revised figures from "Trade and Navigation of the United Kingdom for December, 1923."

England exceeded those into the United States, but in 1915, and after, the proportional amounts of rubber imported into the United States exceeded greatly the amounts imported into the United Kingdom.

Far Eastern Sources

In 1922, 96 per cent of the production of the world was plantation rubber of the Far East; 70 per cent of plantation rubber is grown in the British possessions, 25 per cent in the Dutch East Indies, and approximately 5 per cent in French Indo-China and elsewhere. Furthermore, about one-half of the European capital invested in rubber properties in the Dutch East Indies is British, which, together with that in their own possessions, makes that nation of premier importance in the planting industry, and at the same time gives it the control over the marketing and financial conditions.

The following statement shows the principal primary rubber sources expressed in tons of rubber shipped to the various secondary markets in 1922:

	Long tons
British Malaya (mainly Singapore and Penang)	252,145
Ceylon (Colombo)	39,972
Sumatra (Medan principally)	46,022
Java (Batavia and Soerabaya)	33,626
Brazil (mainly Pará and Manáos)	21,000
Africa (various small markets)	3,060

Thus British Malaya, principally Singapore, is the most important rubber shipping port in the world at present.

Singapore

The importance of Singapore as a market is well brought out by the following figures of the quantities of rubber sold at the weekly auctions:

	Pounds		Pounds
1912	1,169,262	1918	70,930,382
1913	3,379,168	1919	78,626,086
1914	5,973,179	1920	59,460,715
1915	16,401,788	1921	55,239,169
1916	37,419,573	1922	54,486,836
1917	54,469,168	1923	35,880,845

Ceylon

Following is a statement of the quantities of rubber offered at auctions in Colombo, 1912 to 1922, taken from the Annual Reports of the Ceylon Chamber of Commerce.

	Pounds		Pounds
1912	6,260,026	1918	20,869,795
1913	12,013,824	1919	37,927,220
1914	13,338,557	1920	36,078,693
1915	22,333,075	1921	37,383,634
1916	24,675,206	1922	40,202,708
1917	23,039,670		

French Indo-China

There were some 4,500 metric tons of plantation rubber exported from French Indo-China during 1922, almost exclusively by French capital, nearly all of which was taken by the rubber manufacturers of France, but an increasing amount is being shipped to Singapore for sale.

Dutch East Indies

The growing importance of plantation and native rubber exported from the Dutch East Indies is shown by the following figures:

All Ports	1921 Kilos	1922 Kilos	1923 Kilos
Plantation	64,404,000	78,099,000	86,651,000
Native	5,998,000	25,517,000	53,104,000

INDICATING THERMOMETER

A standardized dial indicating thermometer for industrial uses described as "The logical successor to the glass tube thermometer" is here illustrated. This instrument is furnished with either flexible capillary tubing or rigid stem for any range of temperature between minus 40 and 650 degrees F. or its equivalent in Centigrade. It is adaptable to installation where any type of indicating thermometer is used. The feature of this instrument which facilitates temperature readings is the capillary tubing connecting the sensitive bulb with the head of the instrument. The pointer is connected to the Bourdon spring, a "one to one" movement, thereby eliminating all screws, levers, hair springs, gears and other delicate parts subject to wear and adjustment.

Moto Co. Industrial Thermometer

Connection between bulb and Bourdon spring is by means of patented star shaped capillary tubing with a diameter only a third that of ordinary tubing yet having an absolutely free passage.

If the thermometer gets out of calibration it can be recalibrated by screw adjustment of the pointer.—The Moto Meter Co., Inc., Long Island City, New York.

ARGENTINA'S IMPORTATIONS OF AMERICAN TIRES

Argentina represents a leading and steadily developing market for American automobile tires, her importations of these pneumatic casings having increased from a value of $739,306 in 1921 to $987,187 in 1922, the advance continuing to $1,125,720 for 1923. Solid tire figures, at $29,716 in 1921, declined in 1922 to $12,718, rising again, however, in 1923 to $31,809. A steady increase is shown also in the purchases of inner tubes, these being valued at $68,938 in 1921, $141,640 in 1922, and $159,983 in 1923.

The total estimate for Argentina's combined importations from the United States of these three lines of goods is as follows: $837,960 in 1921; $1,141,545 in 1922; and $1,317,512 for the year 1923.

ENGLAND'S IMPORTATIONS IN 1923 OF AMERICAN-MADE RUBBER belting were, at $92,610, nearly triple the value of the corresponding 1922 importation, at $32,289. The 1922 purchase of rubber hose totaled $223,003, the value rising in 1923 to $240,420. Values of packing also advanced from $46,052 in 1922 to $52,906 for the following year.

Tire Factory Manufacturing Costs—IV[1]

Chart of Accounts—Purchase and Contract, Accumulation, Departmental, and "In Process" Accounts

By Joseph J. Dawson

Chart of Accounts

THE efficiency of any organized work is directly proportionate to its simplicity. This fundamental law holds true in a cost system. Every cost or accounting system must have sufficient accounts to properly function and give desired information. Too many and too finely subdivided accounts are just as great a menace to efficiency as are too few. When detail is carried to the burdensome point, the result is dissatisfaction and a tendency toward disinterest in the compiled records. When this condition arises the cost department loses its standing in the organization because of lack of support from official sources and the manufacturing departments. Result,—deterioration of the cost system, distorted costs and eventually utter failure.

The cost department depends upon the general accounting department for data concerning expenses and overheads chargeable to manufacturing. The general accounting department is equally dependent upon the cost department for all details regarding distribution of expenses, payrolls, overheads, etc., and for its information regarding inventories of raw materials, materials and work in process, finished goods and the analysis and cost of sales. It is absolutely essential that the closest cooperation exist between these two departments.

Every organization has its peculiarities in accounting requirements just as it has peculiarities in manufacturing methods. In carrying out the idea of explaining tire manufacturing costs an effort is being made to describe methods and outlines, which if placed in practice will benefit the greatest number. The object of this article is not to endorse any particular method of arriving at results but to state the results required and to offer practical suggestions for accomplishing them.

There are various methods of charting and laying out the accounting scheme. Some desire a code using numbers in series, others use letters, and still others use symbols but unless tabulating machines are used, the only satisfactory designation is by name. This method, though it requires a little more time in the marking of invoices and journalizing, is always understandable. As this work deals with costs and the cost system, only accounts which are essential to cost work will be considered.

Expenses chargeable to manufacturing are incurred, as a rule, in three ways: by purchase, by contract, and by accumulation accounts.

Purchase Accounts (Credit Accounts Payable)

Expenses incurred by purchase embrace raw material inventories and the expense items necessary to manufacturing and merchandising. These items are charges to the various distributed accounts and a credit to accounts payable. In the first article of this series the importance of dependable purchase records was emphasized. If the purchasing and receiving departments have properly performed their duties the distribution of all purchased items is easily accomplished. It has previously been explained that all invoices should be checked with the receiving advice upon receipt and the account to which the material is to be charged should be marked on the invoice by a responsible member of the accounting department.

[1]Continued from THE INDIA RUBBER WORLD, June 1, 1924, 576-578.

The following outline should meet the requirements of the average factory in the case of items incurred by purchase:

1. Material Accounts: (a) Rubber (raw); (b) Minerals; (c) Fabrics; (d) Bead wire; (e) Tube accessories.
2. General and Selling Expenses: (a) General expense; (b) Office expense (stationery, etc.); (c) Packing supplies; (d) Auto expense, gas, oil, etc.); (e) Advertising expense; (f) Selling expense; (1) Salesmen's expenses; (2) Sales promotion.
3. Factory Expenses: (a) General plant expense; (b) Employment; (c) Operating expense (liners, soapstone, etc.); (d) Repairs and maintenance; (e) Electricity; (f) Coal.
4. Capital Accounts: (a) Machinery; (b) Automobiles; (c) Plant; (d) Land and buildings; (e) Fixed improvements; (f) Tools.
5. Sundry Expenses: (a) Freight in; (b) Freight out; (c) Experimental expense.

Contract Accounts

The second channel by which expenses are incurred is by contract. Contract expenses are those which are made up from the company payrolls; namely, services for which previously agreed upon amount is paid, necessary to manufacture and merchandise the finished products. These expenses should be carefully analyzed and allocated in order that substantiating figures may be readily accessible when the expenses necessary to operate any particular section or department of the organization are required for casting purposes.

The accounts commonly used in distributing contracted expenses are:

1. Payroll: (a) Direct labor (By production centers); (b) Indirect labor (By production centers); (c) Supervision (By production centers); (d) Clerking (By production centers).
2. Office Salaries: (a) Order; (b) Purchasing; (c) Receiving; (d) Shipping; (e) Accounting; (1) Cost; (2) General; (f) Planning and production; (g) Employment; (h) Advertising; (i) Sales.
3. Maintenance and Repairs.
4. Superintendence.
5. Power Plant.
6. Administrative Salaries.
7. Salesmen's Commissions.
8. Royalties.
9. Discount.

Accumulation Accounts

The third channel through which expenses are incurred is by accumulation. These expenses are commonly called fixed charges. In the administration of a factory there are certain charges which are more or less constant despite the quantity of production. It would hardly be fair to cause the production for an accounting period to bear the full burden of these fixed charges during a time when the factory output is at a minimum. Accordingly what are termed reserves are set up and the production bears its proportionate share of the annual charges. This method prevents costs from fluctuating and at the same time equalizes the expense burden.

The funds and reserves usually necessary are: 1. Reserve for taxes; 2. Reserve for water charges; 3. Reserve for insurance;

4. Reserve for repairs; 5. Reserve for inventory fluctuation; 6. Reserve for depreciation: (a) Machinery; (b) Tools; (c) Plant; (d) Buildings; 7. Rent; 8. Interest on investment.

Departmental Accounts

To obtain the cost of operating each manufacturing department or production center, it is necessary to carry departmental accounts. As many of these should be opened as the desirability for detailed information necessitates. Payroll and expense accounts are charged with total amounts only, the former from the cash account and the latter from the purchase register or general ledger accounts, as the case may be. The payroll and expense accounts are then credited and the respective departmental accounts charged with the actual payroll amounts and the expense amounts as shown by the overhead distribution records. These combined figures show the cost of operating each department for the accounting period. This information is valuable in compiling charts, records, and unit costs of production.

"In Process" Accounts

In the foregoing the expenses and cost of material attendant upon production have been considered. As the manufacture of the product begins to take place new accounts are required to properly follow its cost through the production, and as the work progresses still more accounts are needed. The new accounts are known as "In Process" accounts.

The rubber industry presents a rather complicated problem in the case of work in process. Unlike other industries, work in process does not begin at the time the raw materials are drawn from stores. Theoretically and for control records it does begin at this point but as a matter of fact at least five, and in some cases more, separate and distinct finished products are produced before the actual manufacture of the finished product begins. For example, washed and dried rubber, compounds, gum stocks, friction stocks, and beads.

In the case of washed and dried rubber the raw material account for rubber is credited with the amount and cost of rubber withdrawn to be washed and dried and the new account is charged with this cost. The departmental account is credited with the labor and overhead necessary to perform the washing and drying operation and the washed and dried rubber account is charged. In like manner the mineral, washed and dried rubber, and departmental accounts are credited and the compound account is charged with the materials, labor and overhead when compounds are produced.

The same procedure is used as the various stages of manufacture are reached, until all materials are ready for the actual production of the article to be manufactured.

The accounts necessary to give "work in process" information are:

1. Rubber Washed and Dried.
2. Compounds (in detail as to kinds).
3. Gum Stocks (in detail as to kinds).
4. Friction Stocks (in detail as to kinds).
5. Beads (by sizes).
6. Treads (by sizes).
7. Air Bags (by sizes).
8. Flaps (by sizes).
9. "Work in Process" Tires (classified).
10. "Work in Process" Tubes (classified).

When all manufacturing operations are completed the product resulting, whether perfect or imperfect, is "Finished Goods." "Work in Process" is now credited and "Finished Goods" is charged with the cost of manufacture. Up to the present time no expense except cost of material, labor and factory overheads have entered into the cost. No further expense should be considered until the product is sold. Methods of overhead distribution will subsequently be described and an explanation as to the manner of distributing both factory and administrative overheads will be given. The reason for only adding factory overheads to the manufacturing cost is because the administrative expense is unquestionably a sales burden and only the merchandise sold should bear it. If some of the production is used for adjustment purposes or given away in the interest of advertising or selling, it is unfair to charge to adjustments or expense anything more than manufacturing cost. If more is charged, then the surplus is being doubly charged as an expense item.

When the finished product is sold, finished goods is credited and cost of sales charged. The net sales less the net cost of sales is the gross profit. This is the result from which administrative selling and corporate overheads must be deducted to obtain the net profit or loss.

As a matter of fact, in giving the foregoing outline of accounts necessary to operate the cost system many items which are distinctly administrative overheads were discussed. It would be impossible to give a comprehensive explanation of the scheme of accounts without taking into consideration all of the overhead items, for in many cases the factory and merchandising operations are so closely linked together as to well nigh defy distribution. For instance, it is often questioned whether the salary of the factory manager is an administrative or a factory expense. If it is the former it should not enter the cost until the product is sold; if the latter, then it should be a part of the factory cost. The best way to solve difficulties of this kind is to analyze thoroughly the duties of the individual or department in question and then make a pro rata distribution.

Modern business demands that the best brains of the organization be brought together, and in this method seemingly heavy burdens are made light, problems and difficulties of manufacturing are quickly solved, and splendid cooperation is engendered in the entire personnel. Let us remember that organization functions in an endless chain and unless every link, however small, is given consideration, the result may be a costly break at a time when it could be ill afforded.

TREATMENT OF BALLOON TIRES

Tests have shown that greater average speed is possible with balloon tires than with the high pressure cords which they replace. It has also been found that a speed can be maintained for considerable periods of time without regard to road conditions, a service which is not possible with the standard high pressure casing.

The balloon tire will not, however, withstand excessive abuse, as the motorist will find if he intentionally rides over the obstacles in his path which he would ordinarily avoid. Balloon tires represent an important development, particularly for maintaining an average speed over long distances, but they are not built for "trick" driving, and, like the high pressure casing, require fair treatment.—*Miller News Service.*

U. S. EXPORTS OF AUTO CLOTH INCREASE

American exports of waterproofed auto cloth have shown a steady increase during 1923 and 1924, total values for the first four months only of the present year being $469,461. The value for the entire year 1922 was $893,853, rising in 1923 to $1,018,914.

While Canada easily continues to hold the lead as a customer for these goods, Australia is showing relatively the greatest advance, taking during the first four months of 1924 a total of $80,354, as compared with only $65,892, the figure for the entire year 1922. Argentina, another important customer, has purchased during this four months period goods valued at $63,907, as compared with $113,021, the total for 1922. Other countries also showing advances are England, Cuba, Brazil, and British South Africa.

Graphical Analysis of the World's Rubber Industry[1]

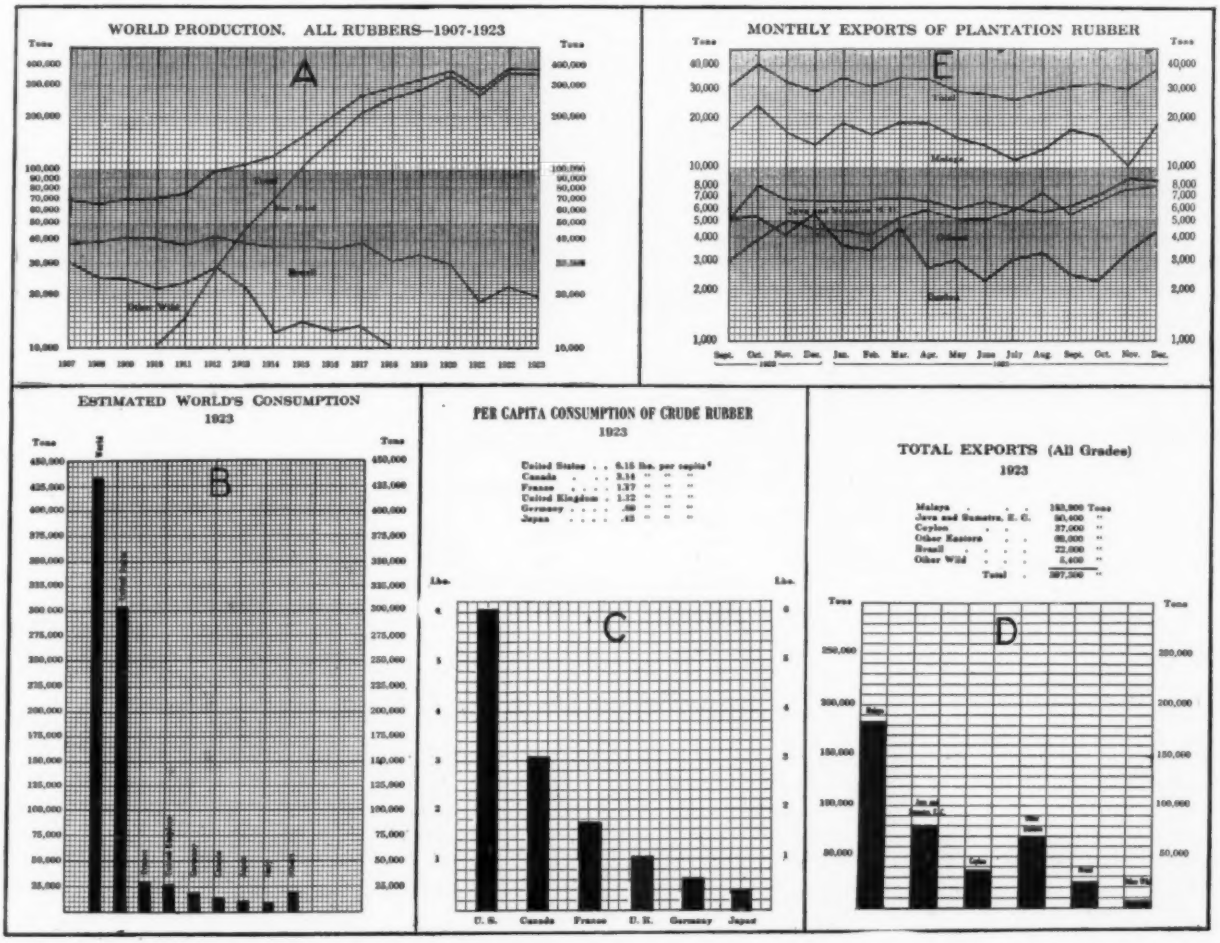
THE accompanying graphs represent part of a series which, published annually, clearly indicate the changes occurring from year to year in the rubber industry. Graph *A* shows the development from 1907 through 1923 in crude rubber production, where the decline in the output of Brazilian and other wild rubbers and the remarkable advance in the production of plantation rubber are well featured. The chart also indicates the slight decline in 1923 in the output of rubber from all producing countries.

In Graph *B* the world's consumption during 1923 at approximately 434,000 tons is shown, and the leading position of the United States at more than 300,000 tons. France follows, at approximately 30,000 tons, the other leading countries being: the United Kingdom, Germany, Canada, Japan and Italy. Consumption by the remaining countries of the world is approximately 20,000 tons.

According to Graph *C* the consumption per capita of crude rubber during 1923 is estimated for the United States at 6.15 pounds; Canada, at 3.14 pounds; France, at 1.77 pounds; the United Kingdom at 1.12 pounds; Germany, at .69 pounds; and Japan, .45 pounds.

The total exports during 1923 of all grades of rubber are estimated in the Graph *D* at 397,300 tons, with Malaya supplying 183,900 tons; Java and the East Coast of Sumatra 80,400 tons; Ceylon 37,000 tons; other Eastern countries 68,000 tons; Brazil 22,000 tons; and other countries furnishing wild rubber at 5,400 tons.

Graph *E* indicates that the total monthly exports of plantation rubber have risen during the period covering the last four months of 1922 and the entire year of 1923 from approximately 30,000 tons to 38,000 tons, the advance being particularly noticeable in the contributions made by the countries indicated as "Others," where a rise from less than 3,000 tons to approximately 8,000 tons is noted. Java and the East Coast of Sumatra have also advanced from about 5,000 tons monthly to 8,000 tons. While Malaya's contribution has changed slightly from 17,000 to 18,000 tons, Ceylon's share has declined from 5,000 to a little more than 4,000 tons.


WORLD PRODUCTION. ALL RUBBERS—1907-1923
A
MONTHLY EXPORTS OF PLANTATION RUBBER
E
ESTIMATED WORLD'S CONSUMPTION 1923
B
PER CAPITA CONSUMPTION OF CRUDE RUBBER 1923
United States . . 6.15 lbs. per capita
Canada . . . 3.14 " " "
France . . . . 1.77 " " "
United Kingdom . 1.12 " " "
Germany . . . . .69 " " "
Japan . . . . .45 " " "
C
U. S. Canada France U. K. Germany Japan
TOTAL EXPORTS (All Grades) 1923
Malaya . . . 183,900 Tons
Java and Sumatra, E. C. 80,400 "
Ceylon . . . 37,000 "
Other Eastern . . 68,000 "
Brazil . . . . 22,000 "
Other Wild . . . 5,400 "
Total . . 397,300 "
D

(A) WORLD'S RUBBER PRODUCTION. (B) WORLD'S CONSUMPTION. (C) CONSUMPTION BY COUNTRIES. (D) EXPORTS BY COUNTRIES. (E) MONTHLY EXPORTS.

[1] Courtesy of F. R. Henderson & Co., New York, N. Y.

What the Rubber Chemists Are Doing

An Improved Rubber Aging Test Involving Oxidation Under Pressure[1]

By J. M. Bierer and C. C. Davis[2]

THIS important paper, with extended references to the literature of the subject is here given in condensed form.

Of most significance is the discovery that not only is the rate of deterioration of vulcanized rubber proportional to the rate of oxygen absorption, but that rapid deterioration in warm oxygen gives the same oxygenated products which are found in aged rubber. It probably follows that the rate of deterioration depends upon the concentration of oxygen present. This does not necessarily imply that oxidation is the only change occurring, for slow internal changes are also taking place, which can be increased or retarded by a change in temperature.

With our limited knowledge of the physical chemistry of rubber it is impossible to formulate the reactions involved in aging. But a better concept may be had if the action is at least ascribed to simultaneous oxidation and degradation by heat. Henriques found by extracting vulcanized rubber with acetone and heating the extracted product at 125 degrees C. for four hours in carbon dioxide, that a new acetone extract was obtained.

Relative Effects of Oxidation and Heat

The relative effects of oxidation, heat, etc., will differ in a tire tread, in a hot-water bag subjected to heat and air, in a hose exposed to sunlight and air or in an insulated wire exposed to all types of weather. No two suffer the same combination of air, heat and light, and the significance of the term 'natural aging" depends on the particular use. But there is no essential difference in the action and it is only a question of the relative severity of the agencies at work.

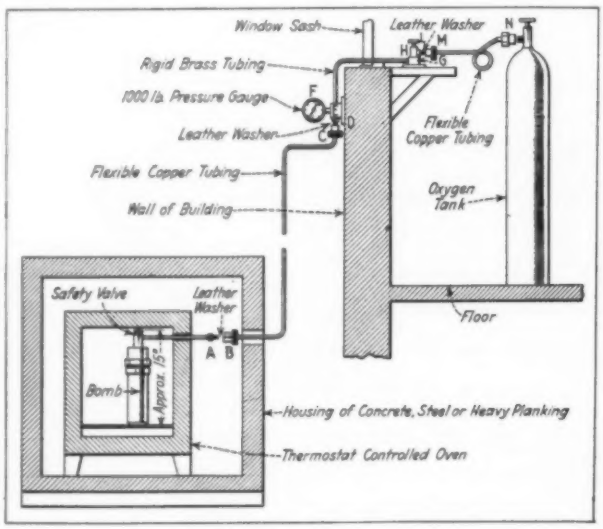
Granted that deterioration is due chiefly to oxidation, which in turn is accelerated by heat, the rate of deterioration becomes a function of the temperature and *the concentration of oxygen*. The degree of deterioration depends on these and on the time.

Artificial Aging Tests

To duplicate the effects of natural aging in a short time, at least one of these factors must be altered. Notwithstanding the increasing evidence that oxygen is the active agent, artificial aging tests have heretofore ignored or minimized this factor and have relied for their acceleration chiefly upon an undue heat effect. The particular conditions which have become most popular are those first advocated by Geer, which consist essentially in heating vulcanized rubber at 70 degrees C. in a moving current of air which can be continuously renewed. This test does not depart so much in principle from some of the earlier tests as it does in recognizing the influence of oxygen. The fact that this test is so convenient has increased its popularity even in the face of its shortcomings.

Shortcomings of the Geer Oven Test

It is a simple matter to compound a rubber stock which will become either soft and tacky in time or progressively harder and more brittle. In spite of this it has not yet been found possible to make these same stocks become soft and tacky or become harder and stiffer in the Geer oven test. It is stated by Geer and Evans that *samples are not hardened as in actual aging, but are definitely weakened.* They do not mention whether or not the acetone extract increases as in natural aging, but it can easily be shown that whereas its increase in natural aging is an index of the extent of its deterioration, in the Geer test the extract does not change materially.



Typical Oxygen Aging Apparatus

There are many important mechanical rubber goods with stocks having tensile strengths below one thousand pounds per square inch. The Geer test is admittedly unreliable for such "cheap" stocks, and yet it may be just as important to foresee the aging of these stocks as higher grade ones. For example, a non-blooming jar ring must be manufactured, the quality of which is indicated by a tensile strength of only 800 pounds per square inch. The Geer test will not show the correct cure to avoid rapid deterioration, or that the stock becomes soft and tacky in time and that by increasing the sulphur slightly the stock becomes very good in its aging properties.

The changes brought about by the Geer oven tests are fundamentally different from those occurring in natural aging. There are many other instances where the 70 degree C. oven test gave either no indication that a compound had a short life or indicated that it had a short life when it did not. High grade litharge stocks like those used in fire hose sometimes drop from 2,500 pounds to one-half this strength in four days at 70 degrees C. yet do not deteriorate materially in several years under natural conditions.

New Test Based on Accelerated Oxidation

Since natural aging is a result chiefly of oxidation, and aging in the Geer test a result chiefly of heat, it would seem reasonable that an artificial test would more nearly approach a natural one if *oxidation* were accelerated. The easiest method of accomplishing this is to increase the concentration of oxygen, in other words its pressure. On this basis an aging test carried out in oxygen under sufficient pressure, at a temperature not too far above normal, should much more nearly approach natural aging than any conditions heretofore suggested. That this presumption is correct has been verified by considerable experimentation. The exact duplication of natural aging becomes a problem of balancing the

---

[1]Printed by courtesy of *Industrial & Engineering Chemistry*. Paper presented before the Rubber Division of the American Chemical Society, Washington, D. C., April 21-26, 1924.

[2]Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

concentration of oxygen and the temperature so that the rate of oxidation and the internal changes due to heat cause the same relative amount of deterioration that they do in natural aging.

Initial Experiments

Initial experiments were made by placing typical rubber goods in an oven at 70 degrees C. but inside an ordinary calorimeter bomb containing oxygen at 500 pounds pressure. It was immediately discovered that deterioration was so rapid that several years of natural aging could be duplicated in a few hours. For example, it had previously been found that a certain red jar ring compound vulcanized to a stiff, "tight" feeling with sulphur low enough not to bloom, had become dead and very tacky after about a year of natural aging. The Geer test had given no indication that the stock would not age well. A few hours at 70 degrees C. in oxygen at 500 pounds put the rings in the same tacky condition in which they were found after natural aging for a year or more, whereas rings of a different rubber compound which were good in a year were much more resistant. Likewise a fire hose tube containing considerable sulphur, which had been overcured and had become hard, short and cracked in two or three years, became hard and brittle in oxygen under pressure for a few hours.

Experimental Compounds

The following three experimental compounds were studied in a systematic investigation of the influence of the concentration of oxygen, the temperature and the time:

STOCKS

Smoked sheets....100	Smoked sheets....100	Smoked sheets....100
Sulphur 4	Sulphur 5	Sulphur 6
Diphenyl guanidine ..... ½	Hexa 1	Litharge 10
Zinc oxide 4	Zinc oxide 5	Precipitated whiting 50
Precipitated whiting 50	Precipitated whiting 50	

Min.	Deg. C.	Min.	Deg. C.	Min.	Deg. C.
20	142	30	142	15	142
30	142	45	142	25	142
50	142	75	142	50	142

These stocks contain three standard accelerators of different types and at the same time approach more nearly to commercial stocks than a simple rubber-sulphur mix in that they are accelerated mixes and with their content of inert filler have a porosity more nearly like the majority of rubber compounds. Incidentally such compounds could be calendered accurately and gave extremely uniform results in mechanical testing.

Experimental Conditions

To investigate the influence of oxygen, heat and time, numerous tests were made in a special Emerson calorimeter bomb the capacity of which was 1100 cc. The accompanying illustration shows the system used in the experiments. The pressure bomb with the samples is closed and placed in a constant temperature oven. To the bomb is permanently attached a rigid pipe long enough to reach the outside of the oven. To this is attached by hand a line of flexible tubing which leads to a gage for reading the pressure and thence by a heavy brass pipe to the control valve. In this line is also a safety plug. The control valve can be connected with an independent line of tubing leading to the oxygen supply. After charging the bomb with samples the system is connected through the control valve with the compressed oxygen and the pressure raised to the required amount. After the necessary pressure is reached the control valve is closed, the valve on the tank is then closed, and the tubing leading to the compressed oxygen tank is disconnected. When the test is completed, the control valve is opened and the pressure in the bomb is thus released, after which the bomb may be disconnected and removed from the oven.

Should an explosion occur, a wave cannot travel back to the oxygen tank. Furthermore, the operator is at no time near the bomb when it is under pressure, for the flexible tubing may be of any length and the control valve thus be as far away as desirable from the oven. Thus the control valve can be located in a laboratory and the oven many feet away outside, protected by an iron case packed with sand bags or any other suitable method of protection.

Danger of Explosion

In this connection warning should be given of the disastrous effects likely to occur under certain conditions. During the earlier part of the experimentation, a relatively large amount, approximately 100 grams, of fine ground vulcanized rubber which had been successively extracted with acetone and water and dried was heated at 70 degrees C. in oxygen initially under 1,200 pounds per square inch pressure. Approximately 2½ hours after starting the test, the charge exploded and completely wrecked the bomb, the oven, the furniture and the walls of the 15 by 10 feet room in which the apparatus was located. This was due, no doubt, to the oxidation increasing at such a rate that enough heat was developed to cause spontaneous combustion.

Effect of Temperature

There is a temperature range, differing for the various stocks, within which they become disproportionately sensitive under treatment with oxygen. Thus in the case of the litharge stock heated for 16 hours under 1,600 pounds of oxygen, the deterioration caused by increasing the temperature from 20 to 50 degrees C. is small. From 50 to 55 degrees C. an extraordinary effect is evident, for the stock becomes sensitive to deterioration out of all proportion to its resistance at lower temperatures. At a lower oxygen concentration a similar though less pronounced phenomenon occurs. Each type of compound appears to have its peculiar range of temperature above which it becomes relatively very sensitive to deteriorating influences. This effect is well shown by a loss in physical quality, which in turn is corroborated by an increase in acetone extract. This is probably not chiefly a heat effect as in the longer heating of the Geer test, for the acetone extract, which does not increase greatly in the Geer test, is nearly the same value for a stock deteriorated to a certain physical state whether this deterioration is brought about at 50, 60 or 70 degrees C. The acetone extract is the same when the litharge stock has dropped in tensile strength from 3,000 to 1,000 pounds under 400 pounds pressure of oxygen, whether this was the result of 16 hours at 60 degrees C. or of 8 hours at 70 degrees C.

Effect of Pressure

At atmospheric pressure, deterioration increases rapidly at first, then more slowly as the pressure increases. From a practical point of view, it is not necessary to use very high pressures; a pressure of 300 pounds per square inch is convenient and safe. This is close to *one hundred times the concentration of atmospheric oxygen.*

The tensile strength and the elongation of the hexamethylene tetramine stock showed the same characteristic changes as did those of the litharge and diphenyl guanidine stocks. The hexa stock at all cures was more sensitive to oxygen and to heat than the diphenyl guanidine stock, but was relatively more nearly like it than it was like the litharge stock.

Acetone Extract

The changes in the acetone extract and in the tensile strength with the time of heating at a given temperature and pressure suggest autocatalysis. Autocatalysis, where a catalyst is either formed or increased in amount during a reaction, is always represented by characteristic S-shaped curves.

The results obtained for the change in ultimate elongation under the various experimental conditions for the three experimental stocks in a state of over or under cure indicate that a stock is most resistant to oxidation under pressure at one specific cure

and that an over cure renders a vulcanized rubber compound particularly susceptible to oxidation.

The increase in acetone extract accompanying oxidation under pressure conforms to that taking place during natural aging, whereas the nearly constant extract in the Geer test is at variance with natural effects. There is no reliable comparison between the changes in quality after natural aging and the changes brought about by the Geer oven test.

Effect of Antioxidants

There has been a rapidly growing interest in the application to rubber of antioxidants, compounds which inhibit or retard the oxidation of much larger amounts of other substances. Many compounds, particularly phenols, when present in very small amounts, inhibit the oxidation of organic compounds and even of oils, resins, rubber and many other technically important substances.

The influence of antioxidants on rubber subjected to oxygen under pressure was determined by incorporating numerous antioxidants in the litharge stock and in the diphenyl guanidine stock used in the earlier experimentation. Twenty such compounds were tested in varying percentages. The results indicate that all these compounds retard the oxidation of rubber when treated with oxygen under pressure in the same way that they retard its oxidation under natural conditions of aging. The results indicate, furthermore, that the greater the amount present the more effective is the retardation. The phenols in general retard vulcanization also, and each determines the optimum cure of the stock containing it.

Effect of Oxidizing Agents

The effect of manganese and copper compounds and sulphuric acid on rubber is the opposite of that of antioxidants in natural aging and are relatively the same as in natural aging.

Effect of Wet and Dry Oxygen

To investigate another condition where it is known that different aging effects are obtained, stocks were submitted to oxygen under 300 pounds per square inch pressure for 16 hours at 60 degrees in dry oxygen and in oxygen saturated with water vapor. In this experiment both the litharge and the diphenyl guanidine stock, intermediate cures, were tested.

It has already been found by Stevens that vulcanized rubber deteriorates far more slowly in a moist atmosphere than it does in a dry one, due to a protective action against oxidation. The results show that under these conditions accelerated oxidation under pressure is also retarded by water vapor.

Absence of Oxygen

To determine whether or not there is a constant involved in all the tests, control tests were made in the absence of oxygen. This was accomplished by subjecting both the litharge and the diphenyl guanidine stocks to 300 pounds per square inch of carbon dioxide for 16 hours at 60 and at 70 degrees C.

Little deterioration occurred in the absence of oxygen in the case of the diphenyl guanidine stock and considerably more with the litharge stock. The sensitivity of the litharge stock above 50 degrees C. is evidently due partly to a specific effect other than oxidation. Since the diphenyl guanidine stock did not show this change, deterioration was negligible in carbon dioxide. The fact that neither stock deteriorated to any such extent as in the oxidation test indicates that oxidation is the predominant factor involved.

Gaseous Oxidation Products

The presence of gaseous products such as carbon dioxide or sulphur dioxide and water was investigated by passing the total volume of gas in the bomb, after treating the litharge stock with 300 pounds of oxygen for 16 hours at 60 degrees C., through an absorption train containing successively calcium chloride, soda-lime and calcium chloride. The results showed that almost the complete reaction involved is represented by the gain in weight.

Presence of Oxygen in the Products

Oxidation is the chief phenomenon involved, and since so little carbon dioxide was recovered from the gaseous products it is almost certain that products containing oxygen are present in the solid product. Since the acetone extract is an approximate index of the deterioration, it is of interest to determine whether substances containing oxygen are present in the acetone extract, and if so whether it contains all the oxidation products. The results obtained show that the original stocks contain no oxygen compounds responding to the pyrrol reaction, that such compounds are formed during the high pressure oxidation and that these compounds are completely extractable with acetone.

Chemical Patents

The United States

PUNCTURE SEALING COMPOSITION. "Turkish bird lime," 320 ounces; borax, 3 ounces; shellac, 6 ounces; methylated spirit, 120 fluid ounces; diatomaceous earth, 120 fluid ounces; perchloride of mercury, 0.32 ounces, and water, 120 fluid ounces.—Charles A. Cleghorn, East Molesey, England. United States patent No. 1,495,383.

METHOD OF PRODUCING CHLORINATED RUBBER. The process consists in subjecting rubber to the action of chlorine in the presence of a solvent for rubber which is in a gaseous state.—Thomas A. Edison, Lewellyn Park, West Orange, New Jersey. United States patent No. 1,495,580.

The United Kingdom

RUBBER COMPOSITIONS. Filling, coloring and vulcanizing agents are reduced to a sludge by grinding with water and are mixed with rubber latex, preferably containing 50 per cent of rubber, to form a creamy mixture. The product is coagulated and dried and may be rolled into sheets for floor coverings or used as an ingredient of rubber compositions. Prior to coagulation the mixture of latex, filling and coloring ingredients may be used as a paint, or when coagulated and dried may be dissolved in a solvent for use as a varnish.—R. Russell, Lands End House, Rhodes, near Manchester. British patent No. 212,597.

COMPOUNDING RUBBER. A special zinc oxide for use in compounding of rubber is characterized by one or more of the following properties: 1. An average particle size not exceeding about 0.15 microns; 2, the capacity of substantially accelerating the cure of compounded rubber; 3, the capacity of imparting to compounded rubber an increased resistance to abrasion of at least 50 per cent as compared with ordinary zinc oxide. Since the incorporation of this oxide in the rubber consumes more energy than is the case with ordinary zinc oxide the following precautions are effective to prevent overheating of the rubber during mixing: 1. The oxide may be made into a master batch with rubber, adding a proportion of this to further quantities of rubber; 2, diluting the oxide with ordinary zinc oxide; 3, adding to the batch a softening agent, such as three per cent of stearic acid.—W. J. Mellersh-Jackson, 28, Southampton Buildings, London, for New Jersey Zinc Co., 160 Front street, New York, N. Y. British patent No. 213,454.

PLASTER. A composition to be molded into blocks, planks, etc., or for applying directly to walls consists of plaster of paris, glue, linseed oil, white lead, rubber solution and alum. Suitable proportions are 2¼ pounds plaster of paris; ½ pound glue; 2 ounces boiled linseed oil containing 3 per cent white lead; 4 ounces rubber solution; 1½ ounces alum, and 1 quart water.—F. E. Eaton, Upper Leeson street, Dublin. British patent No. 213,468.

Italy

Patents Issued with Dates of Issue

568-218 (January 5, 1924). Process for the manufacture of a product similar to rubber. Friedrich de la Rosée, Garmisch-Gartenkirchen, Germany.

569-122 (January 12, 1924). Zinc and phenyldiguamide, new accelerator for the vulcanization of rubber. Societa Lombarda Gomma, Milan, Italy.

American Society for Testing Materials

The 27th Annual Meeting of the American Society for Testing Materials was held at Atlantic City, New Jersey, June 24-27, 1924. Reports of Committees of interest to rubber technologists and manufacturers were as follows:

REPORT OF COMMITTEE D-10: ON SHIPPING CONTAINERS. J. A. NEWLIN, CHAIRMAN. Discussed tests on shipping containers, made by the Forest Products Laboratory and other organizations.

REPORT OF COMMITTEE D-11: ON RUBBER PRODUCTS. F. M. FARMER, CHAIRMAN. Recommended the advancement to standard of tentative specifications for air hose for use with pneumatic tools, rubber belting, rubber matting, adhesive tape, cold water hose and methods of testing rubber products.

REPORT OF COMMITTEE D-13: ON TEXTILE MATERIALS. A. E. JURY, CHAIRMAN. Reported the formation of new sub-committees on test methods and specifications for knit goods and on woolens, which represent extension of the committee's activities into important fields. Submitted specifications for electrical cotton yarns, for osnaburg cement sacks, and for cotton sewing threads. Recommending advancement to standard of tentative revisions in methods of testing cotton fabrics.

The need of standardization of methods of tests and specifications of knitted fabrics has been made evident by the study of many comparative tests in this field made by several rubber works and other laboratories.

Discussion on organizing a new sub-committee of D-13 on methods of test and specifications of narrow fabrics elicited considerable interest and resulted in a decision to organize such a sub-committee, the membership of which will be announced by the chairman of the main committee.

New officers for the ensuing two years were elected by Committee D-13 as follows:

Chairman, W. F. Edwards, United States Testing Co.; first vice-chairman, Russell T. Fisher, National Association of Cotton Manufacturers; second vice-chairman, Horace J. Jaquith, Minot Hooper & Co.; secretary, C. S. Cook, Lawrence & Co. A rising vote of appreciation was extended to A. E. Jury, of the United States Rubber Co., retiring chairman, and also to Mr. Fisher, who has been secretary of the committee.

F. M. Farmer, Electrical Testing Laboratory, and E. N. Grafton, Quaker City Rubber Co., were elected chairman and secretary respectively of Committee D-11.

RUBBER SHACKLES PROVE THEIR USEFULNESS

Another vindication of the rubber shackle as a necessary part of modern automobile and bus equipment appears in an article written by A. F. Masury, vice-president and chief engineer of the International Motor Co., New York, N. Y., and published in the *Journal of the Society of Automotive Engineers*. According to the writer the substitution of rubber shackles for the usual spring shackle means carrying the maximum loads and doing away with the lubricant entirely, while the drawbacks heretofore present in spring shackles have also been overcome.

The use of rubber, in Mr. Masury's opinion, is almost unlimited and is not confined to trucks or motor buses, but may be adapted to any construction or design in which the amount of motion required is not too great. Shock insulators for rail cars are instanced; parts of the steering equipment and the steering wheel itself of a car may ultilize resilient rubber to advantage; while the torsion insulator can take the place of the forward universal joint and cushion the starting as well as the braking effort.

Method for Producing Carbon Black

A recently invented machine combines in one operation several functions in the utilization of natural gas formerly performed by individual machines, among which is the formation of carbon black on the walls of rotating boilers on which dry gas is burned. The term dry gas indicates gas after its gasoline content has been removed by compression and refrigeration in connection with an extraction device.

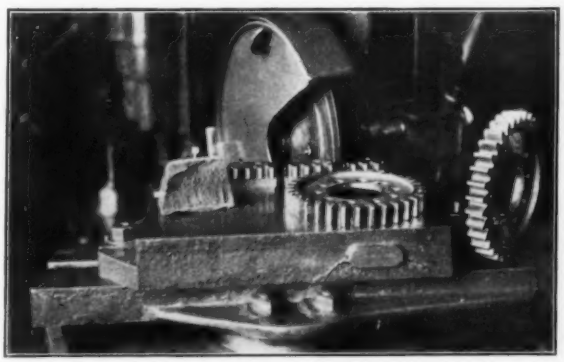
From the gasoline extractor the gas passes to the common double tank storage from which under gasometer pressure it goes to the carbon oven for further and final separation.

Under light pressure it enters the perforated lengths of pipes beneath the steel cylinders and is ignited. The many flames, showing retarded combustion, lap about the lower portion of the cylinders, and the heavy smudge of smoke rises slowly and lodges upon the cylinders. This is the carbon black. Unlike the ordinary process of making carbon black, wherein the flame is directed against the bottom of a steel pan, resulting in uneven burning of the carbon, this new process makes possible the production of a carbon black product of uniform quality. The cylinders are made to rotate very slowly in pairs, one towards the other, the scraper blade removing the carbon and causing it to fall into grooves, from whence it is taken by worm conveyors and dropped into receptacles underneath the oven. The yield runs from one to one and a half pounds of black per 1,000 cubic feet of gas.

The steel cylindrical boilers are kept one-third filled with water, renewal of supply being made to offset loss from steam formation. The water circulation reduces the temperature of the cylinders to a degree assuring the carbon black against being burned. The steam generated within the boilers passes into a manifold pipe and thence to a Westinghouse turbine generator for the generation of electricity.—Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

BURNISHING GEAR TEETH WITH RUBBER WHEEL

The buzzing sound made by transmission gearing is caused by their roughness. This noise can be prevented by polishing or burnishing the teeth. For this purpose a rubber wheel is employed



Journal of the S. A. E.

Rubber Wheel for Polishing Gear Teeth

as shown in the illustration. The wheel does no grinding but serves as a means for carrying the polishing compound. It fits into a rack and is cut on the edge to fit one side of the gear tooth. Polishing a tooth is done very quickly, contact with the polishing wheel of only a fraction of a minute being all that is necessary.

FALL MEETING OF RUBBER CHEMISTS

The sixty-eighth meeting of the American Chemical Society will be held at Cornell University, Ithaca, N. Y., September 8 to 13, 1924. According to the tentative program, divisional meetings will take place September 11 and 12.

Rubber Compounding Laboratory

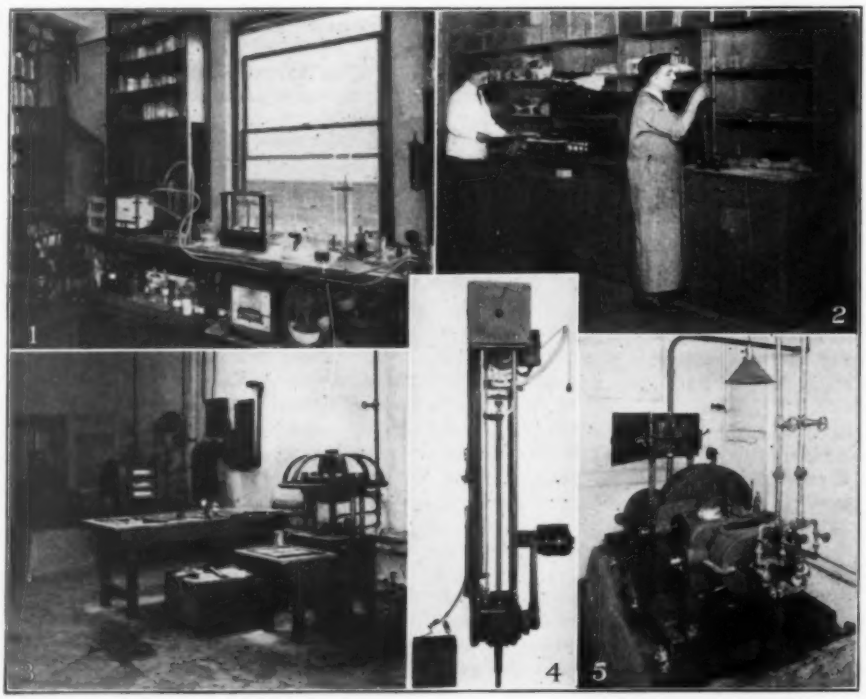
THE influence of compounding ingredients in rubber compositions is so important that the study of their properties and correct technical use has been undertaken in special laboratories, equipped by compounding ingredient manufacturers for their own information and that of their customers.

These laboratories are intended primarily for maintaining standard quality output of specific products and extending their development and use. Rubber manufacturers with technical problems relating to compounding ingredients are invited to utilize these laboratory facilities and results for the mutual advantages to be gained.

Physical Testing Laboratory

The most recently established laboratory for the study of compounding problems is equipped for investigating carbon or gas black from every angle as a rubber compounding ingredient. It occupies a well lighted area of about 1,500 square feet in a modern steel and concrete building within the New York metropolitan district.

The laboratory machinery and equipment has been designed to follow the testing procedures recommended in the recent report of the Physical Testing Committee, of the Rubber Division of the American Chemical Society.



(1) Chemical Laboratory. (2) Preparing Test Samples. (3) Physical Laboratory. (4) Scott Vertical Testing Machine. (5) Mixing Mill with Electric Reversible Safety Stop.
Laboratories of Binney & Smith Co., New York, N. Y.

Laboratory size rubber machinery of the latest type and most approved design has been installed throughout. The mixing mill, located in a special room, is equipped with a reversible electric safety stop device of special interest. This switch, a special adaptation for this laboratory, is mounted over one end of the mill, and from its control lever a chain is carried under a pulley and above the rolls to a point of attachment at the opposite end of the rolls. Pressure upon the suspended chain instantly reverses the mill, releasing any object caught in the rolls.

A 3-roll Farrel experimental calender affords means for sheeting stocks to any gage or laminating them into slabs. The Scott vertical rubber tester was especially designed. It was built primarily to determine the stress-strain curve of rubber stocks and is equipped with an electrically operated automatic load recording device, which makes possible accurate and efficient use of the machine by one operator only.

The arrangement of the pointers for following the stretch lines on the sample is rather unique in that the position of the operator is squarely in front of the machine and the electric switch control for causing the spark is operated by the left hand of the operator simultaneously with his use of the pointer slide. The dial plate of the machine is insulated from the rest of the machine and is connected by electric wiring through an automobile jump spark coil for causing the spark which burns the hole through the paper dial thereby producing the record. The machine is operated by an electric motor and is of the usual inclinable balance type head construction.

It is so arranged that it can carry the autographic recorder of the automatic type if desired. The pointer of the machine can be moved and records taken on several samples, which can be kept on one dial. The dial capacity has been set to 150 pounds to obtain the highest degree of accuracy and yet have capacity sufficient to accommodate Micronex stocks testing four or five thousand pounds on test pieces gaging 0.080 of an inch in thickness.

Study of the toughening effect abrasive wear of and resistance to rubber compounded with carbon black will be made with the aid of an approved form of abrasive testing machine. Also the aging of rubber stocks will be determined by accelerated aging under facilities for scientific control and natural conditions.

Chemical Laboratory

In conjunction with the physical laboratory for compounding and testing rubber stocks a fully equipped analytical laboratory is conducted. Here, facilities are afforded for analysis of materials and investigation of the scientific aspects relative to the use of carbon black in rubber, paint and for other purposes.

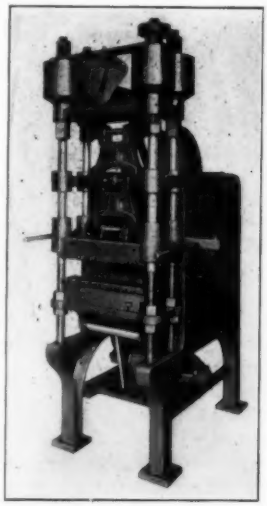
GROUND SULPHUR

Within the past few months specially ground, acid-free, refined sulphur has been introduced to the rubber industry. The degree of fineness is indicated as follows: 100 per cent goes through 100 mesh; 99 per cent through 200 mesh, and 96 per cent through 300 mesh. It is preferred in the industry because the special process used for grinding insures uniform fineness and quality.

New Machines and Appliances

Toggle Joint Vulcanizing Press

A NEW departure in presses for making hot or cold molded articles is here illustrated. The hydraulic principle is entirely eliminated from this press, which is operated by electric motor, compound gearing, cam and toggle, and specially constructed springs which retain the pressure while curing. Molds of special construction for either closed or open molding are mounted in the upper or lower die block.



Terkelsen Mechanical Press

When the press operates, the upper die block moves downward rapidly to within ¼-inch of closing point, then slowly until closed. The pressure retaining springs now start to work. The clutch is thrown out automatically and full pressure is on without any power consumption. Pressure applied is indicated by the pointer and scale at the top of the press.

When the work is cured the pressure retaining springs release and the upper die block moves rapidly upward. The clutch is thrown out automatically and the work is ejected automatically or removed by hand as preferred.

A 50-ton press is operated by a 2-horsepower motor, giving a pressure of fifty tons. Power is consumed for a few seconds only while the pressure is being applied, after which the motor runs idle and the pressure retaining springs hold the pressure while the work is being cured.

This press takes up no more floor space than the ordinary hydraulic press, obviates the cost of pump, accumulator, heavy piping, valves, etc., and saves the space such apparatus occupies.—Terkelsen Machine Co., 326 A street, Boston, Massachusetts.

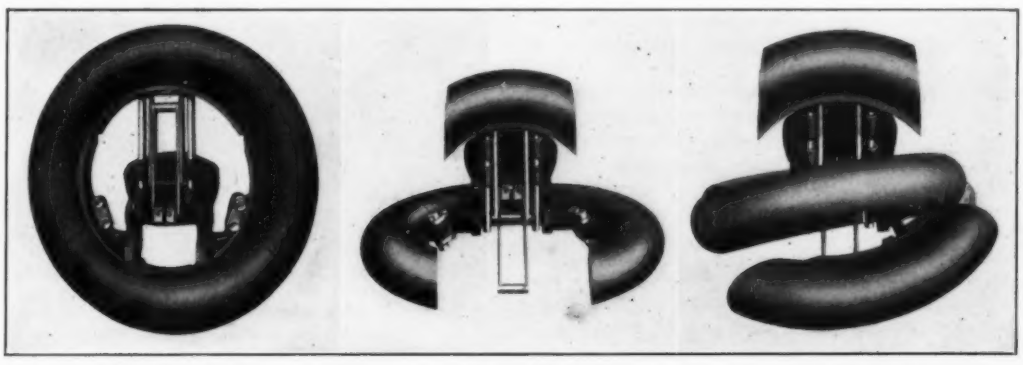
Automatic Balloon Tire Chuck

The automatic chuck pictured here in its three operating positions is claimed to be the quickest, easiest and safest to operate of any now in use. It has no projections beyond the ball of the core to endanger the workman when the core is revolving on the machine.

The core collapses very simply, a pull on the locking lever releasing the first or top section. The core then swings down as shown in the center picture and two sections fold back as in the right picture. In this position the tire slips off at once. Reversing the operations opens and locks the core for building.

All parts are interchangeable and can be quickly replaced. Any chuck will fit any core of the same size. It is built in all sizes for either standard or balloon construction.—The Bridgewater Machine Co., Akron, Ohio.

Cut

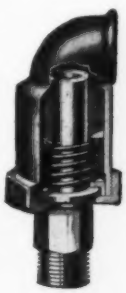


BUILDING POSITION CORE SWUNG DOWN SIDES FOLDED

Bridgewater Automatic Tire Chuck

Tuxeda Swing Joint

The swing joint, here pictured, called the "Tuxeda," is well known to rubber engineers as necessary equipment on all vulcanizing presses. This joint has exceptional wearing qualities that depend upon a fibrous packing kept under constant pressure by a spring which automatically compensates for wear and keeps a tight joint until the packing is worn out. Another feature of the fibrous packing is that, under extreme temperature change, the packing will readily adjust itself to the gland chamber, despite the difference of expansion of various parts. Thus, for alternate steam and cold water service, this connection continuously holds a tight joint. In the new design the joint contains an unusually large packing space, affording exceptionally long life. All parts subjected to corrosive action are placed in sealed compartments so that corrosion is eliminated. The turning member is free floating, permitting easy turning and preventing possibility of sticking and breakage. The design of parts and assembly is such that there are no relative dislocations due to wear.—Franklin Williams, Inc., Newark, New Jersey.



Tuxeda Swing Joint

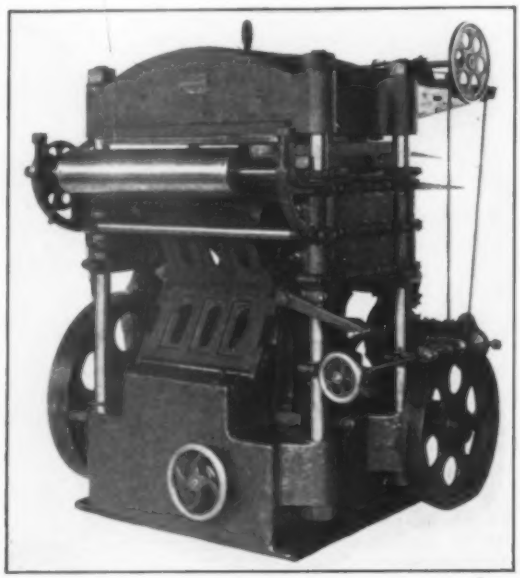
Cutting and Seaming Press

The toggle press here pictured is designed to handle two rolls of single or double sheet rubber, feed the rubber through both decks automatically, cutting, seaming and delivering the material to the operator at the front of the machine. It is successfully used for cutting and seaming pure gum, as well as compounded stock for bathing caps, babies' pants and rubber articles of similar construction.

To secure simultaneous cutting and seaming of a double sheet both sheets are rolled together on one roll. Two such rolls are placed on brackets at the rear of the press. The two sheets from the inside roll drape upon a supporting shelf at the level of the upper deck, while the two sheets from the outside roll drape similarly on a shelf at the level of the lower deck.

The sheets are unrolled by a tape belt which always rests on the outside diameter of the roll, thus giving the same feed, regardless of roll size. The tape belts are driven from an adjustable speed friction by a belt drive from the main shaft. The feed of the sheets is adjusted by the handwheel at the right front of the machine. The delivery roll located on the front of the press is operated by a crank connection from the cam shaft to a ratchet arm which rotates the roll by a set of gears. The connection is adjustable on the arm so that the desired length of rubber is pulled through the press each time, giving a minimum amount of waste between cuts.

Owing to the design of the feed and delivery mechanism, the start of the rubber sheets through the press after each impression is very gradual, thus eliminating all chance of stretching the rubber by a sudden pull on the sheets. The press operates



Standard Power Toggle Press

automatically and continuously, while the operator sits in front of the machine and removes the cut and seamed articles from the sheets.

The stroke of the press is closely adjustable so that the cutting edges of the dies cut through and seam the rubber together without injuring the blades against the steel plates underneath. The press may be motor driven individually or in groups of four or more machines. The clutch is operated by means of a lever at the right side, transmitting the power through a compound train of gears, divided on each side of the machine, to the cam shaft which straightens the middle toggles and these in turn straighten the front and back toggles, forcing the platens upward. The great rigidity of the platens and press permit very accurate pressing of thin rubber articles on the large size platen. Also, it may be used without the delivery and feed mechanisms for molding and curing. The adjustment for pressure and amount of opening is regulated by the handwheel in the front of the base of the machine.

When the press is to be used for molding and curing a reduced gear ratio is used, giving the platen a slow upward movement, thus permitting the rubber to flow properly in the molds before the press closes tight. The toggles are then locked in a vertical position during the cure.

An operator can cut and seam 25,000 pairs of the larger size rubber pants in eight hours. The production of smaller articles can be increased proportionately.—The Standard Machinery Co., Mystic, Connecticut. New York Office, 41 Park Row.

Reflector for Industrial Lighting

A new reflector, here pictured, designed for highly concentrated light, has been planned to give maximum light distribution from a 25 or 50 watt mill type lamp, insuring a high intensity of illumination over the working area.

Concentrated Light Reflector

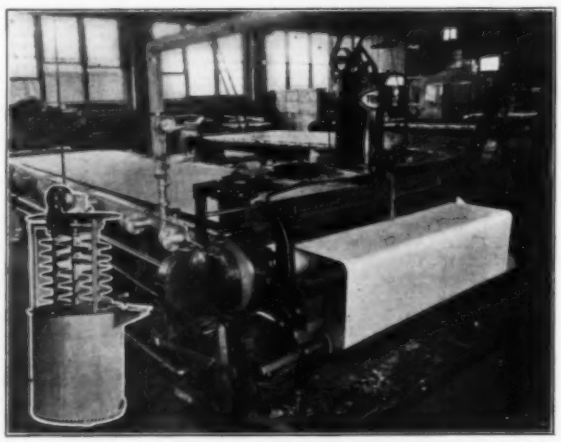
The body of the reflector is a one piece steel stamping to which is applied a ground coat of fired porcelain enamel, and then a finishing coat of enamel, green on the outside and white on the inside. The reflector is provided with a brass holder so that it may be fastened on a brass shell socket without other support.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pennsylvania.

Cement Mixer for Spreaders

Thoroughness and speed of mixing are important factors in maintaining the lowest cost and the highest quality of product in rubber spread goods.

A particularly effective cement mixer mounted on the head end of a Scotch rubber spreader is here illustrated. These mixers vary in capacity from 5 to 65 gallons and over and contain three mixing spirals as pictured in the insert.

The term "Triplex" indicates the three distinct actions of the machine which include: (1) raising the heavy materials to the



Banner Triplex Cement Mixer. Insert—Enlarged View Showing Spirals

center of the tank by the lower spirals, (2) forcing downward the light materials to the center of the tank, and (3) the up, down and around action imparted by all the spirals revolving individually and as a unit. This combination of actions produces

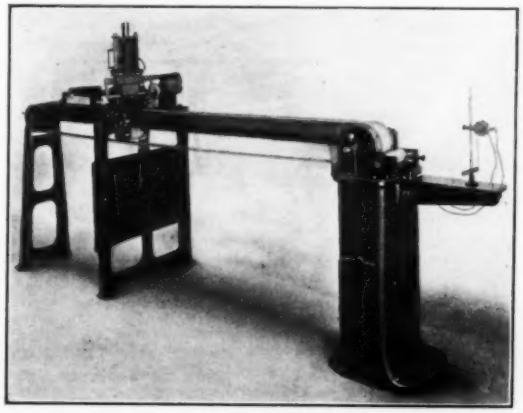
a thorough mixing in the minimum of time with the least expenditure of power.

These mixers are widely used in the rubber and other industries. —The Banner Machine Co., Columbiana, Ohio.

Automatic Stock Cutter for Tubing Machines

Tubing, tire treads or any irregularly shaped stock delivered by a tubing machine can be advantageously and rapidly handled by the machine here pictured.

The machine is fully automatic, comprising a traveling apron with automatic stop, cutting off and deflector attachments, suitably mounted and functioning as follows: The stock emerging from the tubing machine is received on the apron and conveyed by it until the forward end strikes an automatic stop, adjustable for any desired length of cut. Contact with the stop brings into action the automatic cutting off attachment which cuts the stock to the required length. The instant the stock is cut off the automatic



Traveling Apron With Automatic Stop, Cutting Off and Deflector Attachments

deflector pushes the cut length from the apron. Production of cut lengths is limited only by the speed of stock delivery by the tubing machine.—H. Monroe Smith, P. O. Box 198, Passaic, New Jersey.

Machinery Patents

The United States

(1,494,158). MANIFOLD COUPLING. Speed and ease of coupling and uncoupling tire molds stacked in a tire vulcanizer are facilitated by this coupling, comprising a sectional tubular standard resting on the platform of the heater. At the top of the manifold is a spirally bent pipe through which air or water under pressure may be admitted. Spirally bent pig tails are used to convey pressure from the manifold to the molds. The manifold is connected in sections by couplings comprising a nipple with integral nut on its lower side for attachment to the pipe section and on its upper side a seat of spherical or conical form. At its top the nipple carries a threaded sleeve both surrounded by a protecting cylinder affording an annular space accommodating the second clamping member and forming a fluid tight passage.—Charles H. Desautels, Springfield, assignor to The Fisk Tire & Rubber Co., Chicopee Falls, both in Massachusetts. United States patent No. 1,494,158.

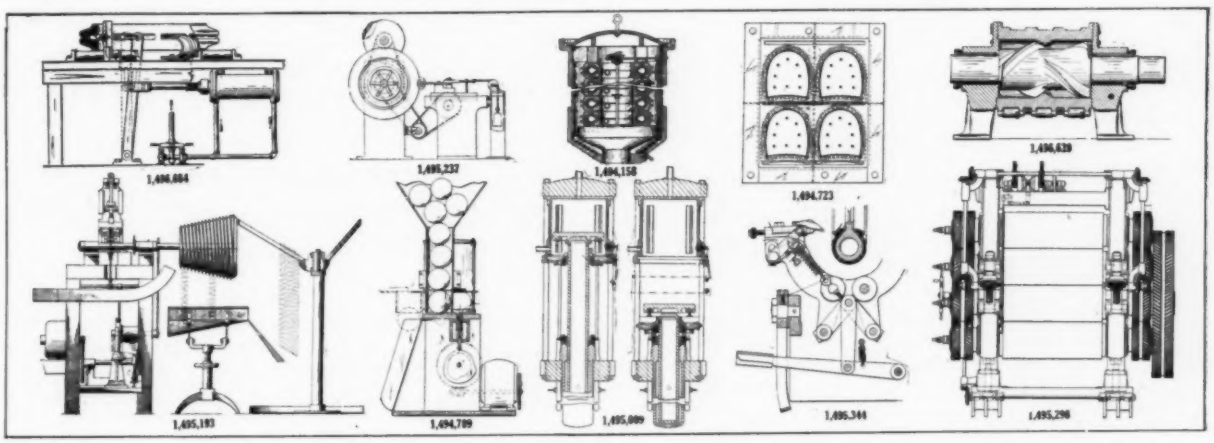
(1,494,709). MACHINE FOR INFLATING HOLLOW ARTICLES. A hopper fed automatic mechanism by which the wall of a hollow ball is punctured by a hollow needle; cement is injected through the needle; the cement is then shut off and inflating pressure is injected and shut off in turn followed by removal of the needle from the article, whereupon the cement, forced outward by the internal pressure, follows the needle through the puncture and seals it.—Fred Roberts, Philadelphia, Pennsylvania. United States patent No. 1,494,709.

(1,494,723). SELF STRIPPING MOLD. A thin hard liner is provided in a heel mold cavity, being secured in the mold frame by a fusible metal connection. The thin edge of the liner projecting beyond the backing forms a mold which is in effect self stripping and reduces the time required in the making of molded articles.—A. Y. Tucker, Mount Vernon, N. Y., and I. A. Watrous, Stratford, Connecticut, assignors to Revere Rubber Co., of Rhode Island. United States patent No. 1,494,723.

(1,495,193). BEAD STAPLING MACHINE. The ends of tire beads are united by a metallic staple, the ends being forced into close abutment just prior to stapling and clinching, so that the circular bead is of exact dimensions. The stapled beads traverse a spirally grooved conical drum, dipping into cement as they pass the drum to the arms of drying racks.—Harvey F. Maranville, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,495,193.

(1,495,237). TIRE MACHINE. Improved fabric stitchers or shapers applicable to any suitable type of tire building machine embodying the essential elements of a driven core and a fabric shaping mechanism. Various pressures upon the fabric may be attained through the use of different weights acting on the cam controlled movement of the fabric shapers.—John C. Allen, Meridian, Mississippi, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio. United States patent No. 1,495,237.

(1,495,298). MULTIPLE ROLL CALENDER. The frame of a multiple roll calender is divided horizontally into two sections, hinged together at the back by pivot studs. The bottom edge of the top section is tongued to fit grooves in the bottom section to secure alinement of the sections when the top section is turned on its



pivots. The top section carrying two or more rolls is easily and accurately adjusted, hinging as a unit with respect to the rolls beneath by means of adjusting screws and worm gearing attached to the bottom section of the frame.—William A. Gordon, Shelton, assignor to Birmingham Iron Foundry, Derby, both in Connecticut. United States patent No. 1,495,298.

(1,495,344). TIRE MAKING MACHINE. In conjunction with mechanism for stitching fabric plies on a ring core, are auxiliary stitchers and trimmers, the operation of which stitches the fabric plies over the toe face of the bead and trims away the excess, the successive actions of the stitching and trimming devices being under the same means of foot control.—William B. Harsel and Edward Nall, deceased, by Edith A. Nall, executrix, assignors to The Goodyear Tire & Rubber Co., all of Akron, Ohio. United States patent No. 1,495,344.

(1,495,009). VULCANIZING APPARATUS. A combined press and pan for vulcanizing tires is so arranged that the ram removes the mold table from the curing chamber after each curing operation. The table is raised sufficiently to permit the molds being removed and replaced by another pile of molds *en bloc*. The pan is stationary and inverted so that the mold table is at floor level when fully withdrawn from the pan. The mold table is formed as a trolley, the pile of molds being run in or out of the curing apparatus upon it.—Walter K. Fletcher and John Rushmer, London, England. United States patent No. 1,495,009.

(1,496,620). RUBBER MASTICATOR AND MIXER. A bladed rotor housed in a two-part, hinged cylindrical chamber provided with hoppers at the ends through which stock is fed to be masticated or mixed. The rotors are so constructed that the material is forcibly pressed and worked against the inner surfaces of the chamber and moved toward and past the center into the other end of the chamber. The hinged chamber is swung open to discharge the batch after mastication or mixing.—D. R. Bowen and Carl F. Schnuck, assignors to Farrel Foundry & Machine Co., all of Ansonia, Connecticut. United States patent No. 1,496,620.

(1,496,684). MANDREL PULLING DEVICE. Removable sectional arcs of the metal core which forms the cavity in a cushion tire are withdrawn by a pulling lever connected successively to each core section. The pulling power is fluid pressure stored in a cylinder direct connected to the pulling lever.—J. M. Straub, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,496,684.

Other Machinery Patents

The United States

1,494,615 Tire mold. J. L. Martin, Colorado Springs, Colorado.

1,496,641 Mixing, incorporating, and disintegrating machine. H. C. Hurrell, London, England.

The Dominion of Canada

240,069 Fabric bias cutter. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of H. R. Gilson, New Rochelle, New York.

240,249 Engraving machine. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of A. J. Young, Preston, Ontario, both of Canada.

240,279 Continuous vulcanizing apparatus. The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of W. R. Urquhart, Los Angeles, Calif.; C. W. Post, Chicago, Ill.; E. Humphreys, Cuyahoga Falls, Ohio, and C. C. Van Arsdale, Akron, Ohio, all of U. S. A.

240,436 Machine for covering bead rings. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of H. V. Leugh, Hartford, Conn., and G. B. Mix, Detroit, Michigan, both of U. S. A.

240,458 Tire building machine. The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of C. L. Landon, Yonkers, New York, both of U. S. A.

240,459 Trimming attachment for calenders. The Goodyear Tire & Rubber Co., assignee of Philip Papano, both of Akron, Ohio, U. S. A.

The United Kingdom

212,565 Tire vulcanizing mold. P. Barre, 199, Boulevard Péreire, Paris, France.

212,676 Molds for dipped rubber goods. F. A. Hughes & Co., Ltd., 1 Regent St., London.

213,332 Machine for coating wire. C. H. Gray, 106, Cannon St., London, England.

213,478 Footwear vulcanizing apparatus. E. C. R. Marks, 57 Lincoln's Inn Fields, London, England.

213,588 Dipping and solvent recovery machine. Martini & Hünecke Maschinenbau-Akt.-Ges., 122 Wilhelmstrasse, Berlin, Germany.

Germany

Patents Issued, With Dates of Issue

395,734 (June 23, 1920). Tire valve. The Payne Valve Corporation, Staunton, United States; represented by: B. Tolksdorf, Berlin W. 9.

395,788 (June 3, 1922). Kettle vulcanizer. Dr. Josef Talalay, Karlstrasse 32, Berlin.

395,850 (June 11, 1920). Kneading and mixing machine. Fernley Hope Banburg, Ansonia, United States; represented by: A. Elliot, Berlin S. W. 48.

396,282 (August 11, 1921). Spreading machine with solvent recovery device. Ernst Hurlbrink, Bachstrasse 2, Berlin.

396,585 (July 16, 1921). Hydraulic press vulcanizer. Leonhard Herbert, Schielestrasse 9, Frankfurt-am-Main.

Design Patents Issued, With Dates of Issue

869,366 (March 11, 1924). Device for roughening leather, rubber and the like. Sigmund Rosenthal, Timisorara, Rumania; represented by: Dr. Y. Winterfeld, Berlin S. W. 61.

870,087 (March 19, 1924). Repair vulcanizing apparatus. Albert Ruof, Apparatebau, Esslingen a. N.

870,306 (June 9, 1922). Comb cutting device. Curt Muller and Paul Muller, Naumburg a. d. S.

870,326 (February 7, 1924). Inner tube vulcanizer. Josef M. Prauschke, Kügelgenstrasse, 37, Dresden.

870,893 (March 27, 1924). Device for attaching rubber heels and soles. Carl Jacob, Mettmann, Rhineland.

Process Patents

The United States

1,496,164 TIRE CARCASS. The tire bead structure is built up of a number of overlying parts formed by applying repeated layers of the tire and bead fabric so that each bead structure is composed of a number of separate portions the units of which are consolidated by pressure to produce the final bead structure. The fabric of the tire structure is wrapped about the bead material as the development of tire and bead progresses. Howard I. Morris, Los Angeles, California, assignor to The Cord Tire Machine Co., Cleveland, Ohio.

1,493,511 Method of making articles of hard rubber dust. C. E. Wing, Flushing, N. Y., assignor to American Hard Rubber Co., New York, N. Y

1,494,157 Method of renovating an airbag. C. H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both of Massachusetts.

1,494,317 Method of making cord fabric. F. Pieraccini, Jr., Springfield, Mass., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,495,362 Method of making cushion tires. J. M. Straub, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,496,753 Method of marking articles of manufacture. C. J. Burkley, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,496,757 Method of separating gases. W. K. Lewis, C. S. Venable and R. E. Wilson, all of Cambridge, Mass., assignors to The Goodyear Tire & Rubber Co., Akron, Ohio.

The Dominion of Canada

240,280 Method of treating rubber articles. The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of W. R. Urquhart, Los Angeles, California; C. W. Post, Chicago, Illinois; E. Humphreys, Cuyahoga Falls, Ohio; and C. Van Arsdale, Akron, Ohio, all in U. S. A.

240,281 Solid tire building method. The Goodyear Tire & Rubber Co., assignee of P. W. Litchfield, both of Akron, Ohio, U. S. A.

240,497 Method of making rubber heels. J. E. Cleland and H. W. Lucas, assignee of half of the interest, both of Montreal, Quebec, Canada.

The United Kingdom

213,165 Method of joining uppers to insoles and soles of galoshes. H. C. L. Dunker, 6 Kungsgaten, and L. G. A. Stibe, 122 Drottninggaten, both of Helsingborg, Sweden.

Germany

Patents Issued, With Dates of Issue

395,926 (November 24, 1922). Method of making rubber objects. Ernst Wiegand, Dresdener Strasse 9, Leipzig.

396,916 (August 14, 1921). Method of making air-pressure tire cores. Paramount Rubber Consolidated, Inc., Philadelphia, Pennsylvania, U. S. A.; represented by: Dr. P. Breitenbach, Dusseldorf.

The Editor's Book Table

Book Reviews

"ANILINE AND ITS DERIVATIVES." BY P. H. GROGGINS. PUBlished by D. Van Nostrand Co., New York, N. Y. Cloth, 256 pages, 6 by 9 inches, indexed. Illustrated.

THIS book is intended for the student of chemical engineering as well as for the graduate engineer or works chemist. Following a review of the discovery of aniline a hundred years ago is a discussion of aniline reaction by the reduction of nitrobenzene. Succeeding chapters describe the equipment and processes for commercial production of nitrobenzene and aniline and discuss the cost factors involved. The remaining chapters cover the following topics: thermal factors in reduction and rectification of aniline; aniline poisoning; physical constants of aniline; miscellaneous chemical and physical data; other methods of manufacture; some derivatives of aniline, and the action of acids and alkalis on engineering materials.

The chapter on aniline derivatives discusses the properties and manufacture of those employed in rubber industry as accelerators of vulcanization, estimated by producers at about 20 per cent of the total American aniline product.

Every rubber chemist will find this book of practical value and interest.

"GUIDE OFFICIEL—SIXIÈME EXPOSITION INTERNATIONALE Caoutchouc, Autres Produits Tropicaux et Industries Connexes." Prepared by Edith A. Browne. Published by Siège Social, 43 Essex street, Strand, London, England. Paper, illustrated, 247 pages, 5½ by 8½ inches.

The official guide to the Sixth International Rubber Exhibition held in Brussels, Belgium, has been printed on rubber latex paper, in both French and English. The publication contains first a list of the displays, with the names of the companies exhibiting; another section is devoted to the work of international conferences, while considerable space is given to the plans and accomplishments of the Rubber Growers' Association. There are special sections dealing with the industries of the French colonies, the Congo, Brazil, Colombia and Mexico.

"INVENTOR'S MANUAL—HOW TO MAKE A PATENT PAY." BY George M. Hopkins, revised by A. A. Hopkins. Third edition, enlarged. Published by The Norman W. Henley Publishing Co., 2 West 45th street, New York, N. Y. Cloth, 138 pages, 5 by 8 inches.

In the preface to this little volume the author states that his aim has been to give the inventor some general hints regarding patents and the most approved methods of bringing them to public notice. Some of the leading chapters are headed: "Inventor and Invention;" "Making and Prosecuting Your Own Application;" "Patent Advertising;" "A Word About Coupon Attorneys;" "Reversion of a Patent;" "Fraud in the Sale of a Patent;" "How Patents Promote Trade;" "Foreign Patents;" and "The Value of Patents." As a final word the author urges strict honesty in all the processes concerned, and states that in promoting patents "common sense is easily the controlling factor."

"L'INDUSTRIE DU CAOUTCHOUC." BY JULES GOLDSTEIN. Published by the Imprimerie Crozatier, 3 Impasse Crozatier, Paris. Paper, 40 pages, 9½ by 6½ inches.

This lecture given before the Association of Russian Engineers, Paris, reviews the different methods of vulcanizing rubber, rubber manufacture in general, and describes the processes employed in the manufacture of erasers, tubes, dipped goods, tires, cut sheet, ebonite, hollow goods. In connection with the latter the author describes an invention of his own whereby all preliminary work is eliminated and the only operation required is vulcanization, while the equipment is reduced to presses and molds. He concludes with a brief survey of the American rubber industry.

"POPULAR RESEARCH NARRATIVES—TALES OF DISCOVERY, Invention and Research." Collected by the Engineering Foundation, 29 West 39th street, New York, N. Y. Published by Williams & Wilkins Co., Baltimore, Maryland. Cloth, 152 pages with index, 5 by 7½ inches.

This small volume contains fifty brief articles contributed by various scientists working in the fields of chemistry, electricity, and metallurgy. Two interesting chapters are headed: "Helium," and "The Birth of Bakelite; its Growth."

New Trade Publications

AN ILLUSTRATED CATALOG OF 36 PAGES ENTITLED "WESTINGHOUSE Fittings for Pipe Structures" has been prepared for the use of the industry by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. This circular, supplemented by dimensional drawings, describes the fittings under consideration and gives their application to such work as the erection of outdoor substations, switching equipment, switchboard frames, railings, etc. Another feature of the publication is the description of another new Westinghouse product, an adjustable insert designed for fastening machinery or other equipment to concrete floors, walls, or ceilings.

VARIOUS STATISTICAL TABULATIONS OF INTEREST TO THE RUBBER industry are issued from time to time by F. R. Henderson & Co., Inc., crude rubber importers, with offices at 250 West 57th street, New York, N. Y. These separate pages are perforated to allow insertion in the annual publication prepared by the company for the rubber industry.

THE JUNE BULLETIN ISSUED BY THE ROESSLER & HASSLACHER Chemical Co., 709 Sixth avenue, New York, N. Y., contains lists of the company's products, and also references to the special work of various departments. Mention is made of the company's rubber laboratory staff, which is prepared to furnish, without charge, to the rubber industry any available information regarding accelerators.

AN ILLUSTRATED CATALOG, PRINTED IN FRENCH AND ENGLISH, and descriptive of certain products displayed at the Sixth International Rubber Exposition has been prepared by the Rubber Growers' Association, Inc. Various divisions of the catalog are devoted to lists of the displays arranged at the exhibition by British Malaya, Ceylon, and other rubber-growing countries, as well as to an outline of the work being accomplished by the Rubber Growers' Association. The catalog is printed on rubber latex paper.

IN CELEBRATING ITS FIFTIETH ANNIVERSARY, THE DAVOL RUBBER Co., Providence, Rhode Island, has issued an unusually attractive catalog, its many illustrations being in color. The company specializes in the production of rubber goods for surgical and hospital uses.

Recent Articles Relating to Rubber

A New Colloid Mill. Descriptive of the Premier colloid mill, which is not a "beater" type but on the contrary is a hydraulic disintegrator in which several forces are developed as well as an electric effect, and in the combined resolution substances are reduced to a colloidal state.—William A. McLean. *Industrial and Engineering Chemistry*, May, 1924, 494-496. Illustrated.

On the Efflux of Plastic Materials at Low Velocity. Experiments with crude rubber mechanically plasticated show that under certain circumstances the velocity of the efflux of this material through an opening is proportionate to the square of the amount of force exerted on it. Experiments with other plastic materials

appear to indicate that this law is not peculiar to rubber.—B. Marzetti; presented by G. Bruni. *Reale Accademia Nazionale dei Lincei*, volume 32, series 5a, second half-year, No. 11. Diagram, table.

The Coming Crisis in Rubber—I. Serial attempting to show that there has, in reality, never been any over production of rubber and that on the contrary we are threatened by under production in a comparatively short time.—E. Girard, *Revue Generale du Caoutchouc*, April, 1924, 48-51.

The Coming Crisis in Rubber—II. E. Girard, *Revue Generale du Caoutchouc*, May 1924, 48-52.

Synthetic Rubber—I. Chemical composition of natural rubber described and the work of different scientists in connection with synthetic rubber is reviewed.—R. Fric, *Revue Generale du Caoutchouc*, April, 1924, 7-12.

Synthetic Rubber—II. —R. Fric, *Revue Generale du Caoutchouc*, May, 1924, 5-9.

Some Remarks on Ebonite. Formulæ. Remarks on quality, color, fracture, etc., of the resulting product.—Albert Huntin, *Le Caoutchouc et la Gutta Percha*, May 15, 1924, 12190-12192.

Silica and Silicates—I. The properties of silica and silicates in connection with their use in the manufacture of rubber.—André Dubosc, *Le Caoutchouc et la Gutta Percha*, May 15, 1924, 12193-12194.

The Technical Organization of a Tire Factory. Second and final installment.—*Le Caoutchouc et la Gutta Percha*, May 15, 1924, 1219-1219.

Formulæ for Rubber Mixings. Continuation. Bottle mixings for red washers. Formulæ for brown and white substitutes, pitch, soya oil, etc.—Dr. Rudolph Ditmar, *Le Caoutchouc et la Gutta Percha*, May 15, 1924, 12197-12199.

On the Changes in Rubber in the Course of Hot Vulcanizations. The authors have established a new vulcanization curve which proves that the usual view of the changes that take place in rubber during vulcanization is erroneous. The character of the new curve remains the same under all circumstances. During pre-vulcanization, viscosity increases continuously; this period ends with a sudden decrease in the solubility of the rubber. When pre-vulcanization has ended, two opposed processes take place simultaneously, the one characterized by an increase and the other by a decrease in the solubility of the rubber.—Otto Nauck and A. E. Lange, *Kolloid-Zeitschrift*, May, 1924, 297,304. Tables, diagrams.

Problem of Vulcanization. Alteration in the Colloidal Condition of Rubber by Vulcanization and by Calcined Magnesia as Accelerator of Vulcanization. —H. Feuchter, *Kolloidchemische Beihefte*, 1924, 47-71.

Physical Testing of Rubber and Factory Practice. A discussion of physical testing of crude and vulcanized rubber by laboratory and semi-commercial methods, including tests of plasticity, aging properties, abrasive wear, tearability, hardness, rigidity and elasticity, hysteresis tests, traction, bending and compression tests, etc.—Philip Schidrowitz, *Rubber Age*, London, May, 1924, 129-139.

Antimony Sulphide. A plea for the extension of the use of antimony sulphide in rubber manufacture. Comparison of golden and crimson sulphides, giving excellent products with a minimum of sulphur. The golden pigment containing the smaller quantity of antimony has the greater accelerating effect. Vulcanized rubber mixtures containing antimony sulphide show a higher figure for combined sulphur than either straight rubber-sulphur or zinc oxide mixtures. As an accelerator antimony sulphide possesses the advantage that the rate of cure can be accelerated to suit conditions by varying the amounts of the antimony and sulphur in the mixing.—E. Bruce Warren, *The Rubber Age*, London, May, 1924, 146-148.

Use of Rubber Latex in Paper Sizing.—Klemm, *Chemiker Zeitung*, April 22, 1924, 253.

Studies on the Vulcanization of Rubber. Brief review of the discovery of vulcanization and its development. Criticism of Ostwald's theory and review of experimental work on proteins and resins in rubber. Vulcanization by colloidal sulphur is summarized and tests of vulcanized rubber samples are given. In a second installment the author in addition to his own theory of vulcanization discusses those of others, and shows the importance of sulphur and the various substances added to rubber producing colloidal sulphur under the influence of heat as affording the key to the explanation of the vulcanization of rubber.—André Dubosc. —The *Rubber Age*, New York, May 10 and 25, 1924, 92-94, 133-135.

Rate of Absorption of Water by Rubber. Pieces of rubber were weighed before and after immersion in water, the immersion varying from one week to nearly two years. The experimental error is unavoidably high. If it is assumed that the water enters by diffusion only, that no physical or chemical change takes place when the water enters the medium, that the external surface is saturated almost instantaneously, and that the water entering by the edges is negligibly small, then the process resembles the case of simple diffusion to which Fick's law applies.—D. H. Andrews and J. Johnston, *Journal American Chemical Society*, 1924, 46, 640-650.

Regeneration of Vulcanized Rubber. A chemical discussion of the unsolved problem of converting vulcanized rubber into its original unvulcanized state.—André Dubosc, The *Rubber Age*, New York, June 10, 1924, 172-174.

Rubber Substitutes. These compounds possess some elasticity and low specific gravity but are in no real sense substitutes for rubber; they impart qualities to mixings, however, not easily obtained without them. A list is given of the oils used for making rubber substitutes and the methods are detailed for making white and brown substitutes. It is characteristic of both varieties of substitutes that they exert a poisonous effect on organic accelerators. This can be partly overcome by the addition of magnesia. Substitutes are little used where strength is desired.—E. Bruce Warren, *Rubber Age*, London, June, 1924, 200-202.

Coalescence and Coagulation.—O. de Vries, *India Rubber Journal*, April 26, 1924, 13.

A New Test for Crude Rubber. The author shows that a determination of the viscosity in acidified benzene, besides the viscosity in ordinary benzene, promises to become a valuable acquisition in the study of the factors that influence the properties of rubber. —O. de Vries, *India Rubber Journal*, May 24, 1924, 13-18.

Judicial Decisions

CLINE STEWART CO., ET. AL. VS. UNITED STATES. UNITED STATES General Appraisers, New York, May 22, 1924. (Treasury Decisions, 40,210—General Appraisers, 8807.) Protests 961,255, etc., against the assessment of duty by the collector of customs at the port of Los Angeles.

Large rubber balls were assessed with duty as toys at 70 per cent ad valorem under paragraph 1,414, tariff act of 1922. The importing company protested, claiming that the merchandise was dutiable at 30 per cent ad valorem under paragraph 1,402, or at 25 per cent ad valorem under paragraph 1,439 of the same act. Although there was some dissenting opinion, the decision was reached that the protests should be sustained, and that the balls, as toys used solely for the amusement of children, were properly dutiable under the provision in paragraph 1,402, at 30 per cent ad valorem.—*Treasury Decisions*, Vol. 45, page 25.

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.

New Goods and Specialties

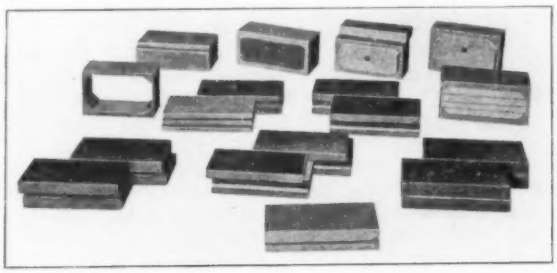
Stemless Football Bladder

THE SPECIAL feature of the new stemless valve which is being introduced to the sporting goods trade just now is the fact that the valve is vulcanized in place so that all danger of leakage is eliminated, and has a red rubber protective cap. It is simple and rugged in construction, consisting of only five metal parts and two of rubber. Flexible connection with universal thread may be secured from pump manufacturers to fit the valve and thus make re-inflation a simple operation which the customer can take care of himself. This makes possible the sale of a pump with every bladder. The bladder is firmly locked to the flap, and when inflated the ball laces snugly, giving a flush closure. The stemless valve has been made a feature of the official bladder for football, basketball, soccer or volley ball, and striking bags.—The Seamless Rubber Co., Inc., New Haven, Connecticut.

Red Top Stemless Bladder

A Cushioned Rubber Paving Block

The rubber paving block illustrated is of a graded construction having a core or inner body of very hard substance and a road surface of durable rubber. At the base of the block is a layer of softer compound which prevents the full force of the traffic

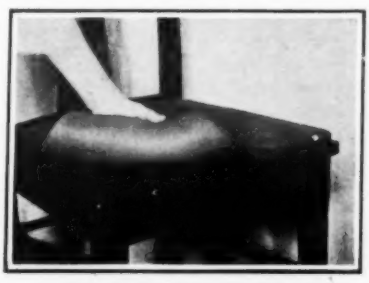


Cowper's Interlocking Rubber Paving Blocks

movement from being transmitted to the concrete or other foundation of the road. All the blocks are the same in shape, size and construction and when laid they interlock on all sides. This prevents movement and forms a sealed joint between the blocks, thus preventing water from seeping through to the base.—J. Sheridan Cowper, 24 Queensbury Place, London, S. W. 7, England.

Sponge Rubber Chair Cushion

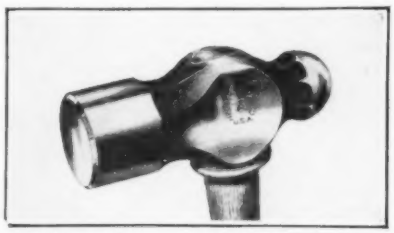
A recent development in chair cushions is of sponge rubber. It is designed especially for office use and is resilient and comfortable and lies flat on the seat, requiring no straps to hold it in place as does the felt or leather pad. —The Sumatra Rubber Co., Salem, Ohio.



Unvulcanized Rubber Chair Pad

Rubber Shock Absorbers for Hammers

An improvement to carpenters' hammers and machinists' ball-peen hammers employs a rubber cushion between the handle and the head, completely insulating the metal from the wood, so that the hand, arm and shoulders of the workman are protected from the jar of the blows. The manufacturer claims that this tends to preserve energy and lighten the day's work in the same way and according to the same principle as rubber heels do for those who wear them.—Heller Brothers Co., Newark, New Jersey.



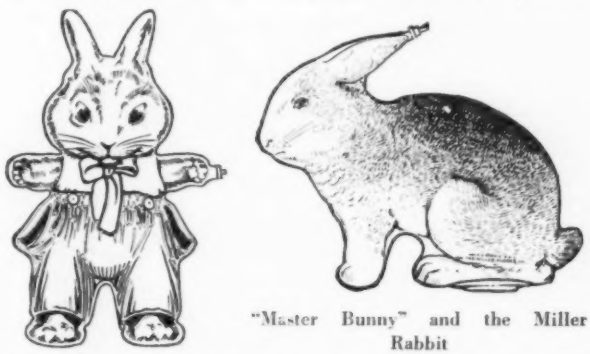
Ball-Peen Hammer with Shock Absorber

The "Dunlop Clipper" Makes Its Debut in America

The American Dunlop works has recently introduced in the United States the "Dunlop Clipper," a normal size clincher which has been featured for several years in England, Canada, Australia, and South Africa. In appearance it is similar to the Dunlop standard pneumatics and balloons, except that the tread blocks are of a slightly different pattern. The name is intended to call to mind the type of English sailing vessel famous for its speed.—Dunlop Tire & Rubber Co., Buffalo, New York.

New Characters in Miller Inflated Toys

The Miller line of inflated rubber toys is constantly enlarging, the manufacturers claiming that this line is a very positive business builder for retailers. An interesting assortment, which is sold in unbroken lots, includes a gorgeously decorated elephant, a



"Master Bunny" and the Miller Rabbit

sheep, a pig, a cow, a dog, a donkey, a camel, a cat, a dressed-up monkey, a policeman, and two other comic human figures. The rabbit and "Master Bunny," shown in the accompanying illustration, are more recent developments and are not included in the assortment mentioned.—The Miller Rubber Co., Akron, Ohio, U. S. A.

A LIGHT WEIGHT WATERPROOF AND WINDPROOF GOLF JACKET, marketed by the Domestic Products Co., Dayton, Ohio, is so constructed that it can be folded up in a pouch and carried in the golf bag. It weighs only 8½ ounces and is proofed by a new process.

Rubber Massage Cap for Beauty Parlors

The special object of the massage cap illustrated is to do away with the towel used to hold the hair out of the way during a facial massage. It is made of rubber material and is easily sterilized by dipping in cold water which contains a little disinfectant. It is therefore claimed that it will save its cost in towel washing in one week, besides being more comfortable than a towel. —Poole's Stringless Specialties, 351 West 25th street, New York, N. Y.

Rubber Massage Cap

Non-Breakable Rubber Buttons

The manufacturer of the rubber button illustrated claims that these buttons can be boiled and ironed and are absolutely laundry-proof, being capable of withstanding all acids, lye, and gasoline, and that they will not break in the wringer or cut the wringer rolls. While readily buttoned, they do not come unbuttoned as easily as glazed surface buttons, and they cannot be broken, even in the button sewing machines used in factories. They are made in a variety of sizes and colors, and with two or four holes.—Non-Breakable Button Corporation, Milwaukee, Wisconsin.

The Rubber "Stay-On" Button

Vacuum Rubber Cup Display Equipment

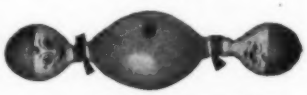
This item, made entirely of best quality Pará gum, will no doubt prove profitable to the retailer of small wares on account of the variety of classes of trade to which it will be useful. By simply dipping it in water it is immediately applicable to glass, marble, enameled metal, polished wood or any non-porous surface and will hold up posters, cards, or merchandise weighing as much as 5 pounds. No adhesive of any kind is necessary and the glass or polished surface need not be washed when the Vac-U Holdup is removed. Its position can be changed any number of times without affecting its holding ability. They are inexpensive and practically indestructible.—Mayer Manufacturing Corporation, 1608 S. Wabash avenue, Chicago, Illinois.

Mayer's Vac-U Holdup

THE EAGLE RUBBER CO., ASHLAND, OHIO, HAS AMONG ITS ITEMS of special attraction for children a "nose blower," a device to help the small boy make a loud noise behind his pocket handkerchief. It consists of a piece of flat rubber tubing one end of which is held in the mouth while at the other end is the noise-maker.

New Type of Balloon Toy

A balloon toy that makes several different kinds of noises, according to the way it is squeezed, is sure to be a popular seller. The "Noyzee Dumbell" illustrated is also called the howling twins because of its two heads, and it is claimed by the manufacturers that it not only cries and howls but cackles and barks under the proper pressure. It is provided with a shut-off valve and stopper to prevent the air from leaking out.—The Perfection Rubber Co., Cleveland, Ohio.



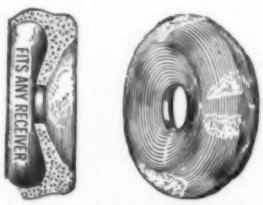
The "Noyzee Dumbell"

New Slazenger Tennis Ball

The Frank L. Slazenger Corporation, 12 East 43rd street, New York, N. Y., representing Slazenger, Ltd., London, England, are introducing in the United States a lawn tennis ball which the makers claim has greater resiliency, longer playing life and more perfect shape than any other on the market. The balls are made in either the stitched or stitchless cover.

Sponge Rubber Ear Cushions for Radio Receivers

The object of the sponge rubber Fonekushion illustrated is to make the radio headset as soft and easy on the ear as it is possible for it to be. The sponge rubber conforms to the shape of the ear and relieves the pressure of the hard rubber cap. It eliminates outside noises, since it covers the ear entirely, thus enabling the listener to get the full benefit of the signals, and since no metal can touch the diaphragm the signals are reproduced without rattle or distortion. The Fonekushions are inexpensive and the proposition to dealers and jobbers allows a wide margin of profit. —Radio Industries Corporation, 131 Duane street, New York, N. Y.



No. 500 Sponge Rubber Fonekushion

Rubber Spats from Old Inner Tubes

Old inner tubes are becoming somewhat of an inspiration to inventors. A short time ago we showed pictures of ladies' handbags, pillow tops and rugs made from them, and now comes an English inventor with a rubber spat, which although it may be made from any elastic material or from a rubber compound, may be conveniently and inexpensively cut from inner tube rubber. It is seamless and may be slipped on and off at will. The strap which fits under the shoe may be of tape or leather or it may be cut in one piece with the material of the spat.—George Morris, patentee, 53 Croydon Road, Erdington, Birmingham, Warwick, England.

Seamless Rubber Slip-On Spat

Submarine Water Guard Bathing Cap

One of the bathing beach novelties of last season was the Submarine Water Guard, worn under an ordinary bathing cap to exclude water from the ears and designed to keep the hair dry during the most boisterous water sports. This season the water guard has been incorporated into a cap which functions exactly like the water guard and is constructed on the same principle, being molded in one piece from pure gum rubber, without snaps or buckles, seams or straps. The patented ear pocket prevents pressure of the rubber on the ears, at the same time preventing the cap from slipping. The "rib," another patented feature, insures a snug fit by conforming to the contour of the face, ears, and neck.—Lew-Mar Products Co., 229-231 Fourth Avenue, New York, N. Y.

Submarine Water Guard Cap

Sturdy Waterproof Hunting Boot

The hunting boot illustrated is one of the sturdiest of those shown in the advance catalogs. It has a heavy rubber sole and is equipped with snow excluder. The style is conservative, the special features being its wear and weather-resisting qualities.—Gutta Percha & Rubber Limited, 47 Yonge street, Toronto, Canada.

Next Season's Hunting Boot

Hose Helps to Curb Epidemic

Rubber hose recently played an important part in helping to check the spread of the hoof and mouth disease from California into Arizona. Prior to the absolute ban being put on travel, one precautionary measure against the cattle epidemic was the disinfection of all automobile passengers crossing Arizona's western border, a strong germicidal solution being atomized over their clothes and the upholstery of their cars by means of garden hose attached to power sprayers mounted on trucks and of the type used for fumigating fruit trees.

Inner Tube with Self-Sealing Feature

The Allyn "Self-Seal Leak-Proof" inner tube consists of two tubes of best quality stock with a layer of plastic rubber between them which prevents leakage of air through pores in the tube stock, thus maintaining uniform air pressure for months. A half circle of the same plastic rubber is placed against the tread side of the innermost tube on the inside. In case of a puncture the plastic rubber clings to the intruding object, which, when it is withdrawn, pulls the rubber through the hole thus made in the tube stock, plugging and permanently sealing it. The manufacturers claim that many tests have proved that not an ounce of air is lost in this process. The double wall construction prevents pinches on the rim, one of the most frequent causes of tire trouble.—H. H. Allyn Rubber Corporation, 309 Disco Building, Norwich, Connecticut.

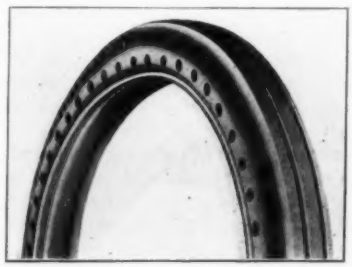
Cross Section of an Allyn

Automatically Adjusted Tire Flap

A recently patented tire flap has two adjustable ends, which slide back and forth to fit any size of rim or tire, one size flap being used for all tires, which, the manufacturers remind us, means a smaller investment and stock and a more frequent turnover. This flap is said to fit like a glove, without wrinkle or bulge and conforming exactly to the measurements of rim, tube and casing. Its overlapping ends compensate for any shrinkage.—Beaney Manufacturing Co., 144 West 54th street, New York, N. Y.

A New Airless Tire

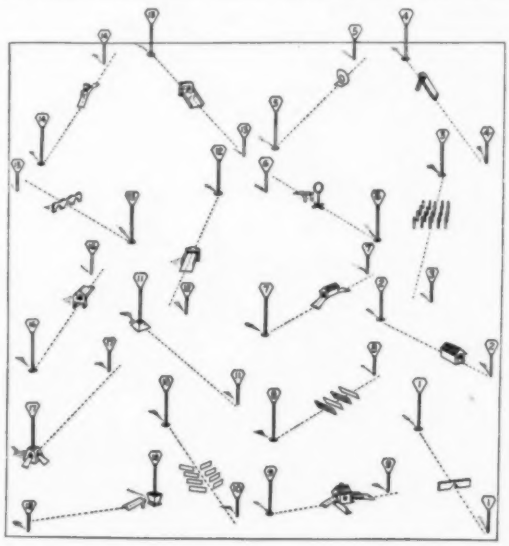
The airless tire illustrated is not yet on the market but it is on its way. The company claims that it is the most resilient of all airless tires and the hardest to manufacture. The openings are about 7/8-inch apart and on the lower half of the tire. They are staggered and alternate, one running up at an angle of about 35 degrees and the next one running down at an equal angle. From the side view of the tire it looks as though there were two rows of holes but there is only one row.—The Milan Tire Co., Morgantown, West Virginia.



Milan Airless Tire

Obstacle Golf, a New Lawn Game

An interesting game, designed to keep up putting interest among golfers, may be laid out on a lawn or putting green and in many places where there is no chance for a golf course. The play may be match, medal, or two-ball foursome. The illustration shows an 18-hole obstacle green and minute directions are given in a little booklet which the company issues, so that non-golfers may join in the game. The obstacles are in red and white colors and make a very attractive appearance on a green lawn. The game may also be played indoors.—Mason Manufacturing Co., South Paris, Maine.



18-Obstacle Golf Course

Activities of the Rubber Association of America

Committee and Division Meetings

THE Executive Committee of the Association met at the Lotos Club, New York, N. Y., on June 6, when matters of a routine nature were given attention.

The Solid and Pneumatic Sections of the Truck Tire Committee met at the New York Athletic Club, New York, N. Y., on June 17. The Committee recommended that certain sizes of solid and cushion tires be eliminated. The recommendations, however, do not affect tractor and industrial truck tire sizes.

Consideration was given to the desirability of revising the Standard Tire Warranty now applicable to solid and cushion tires, to make it correspond to the new 90-day warranty covering all pneumatic tires; but no final decision was reached.

The Committee gave attention to the practice of some truck and bus manufacturers in equipping with inadequate pneumatic tires and rims and the desirability of undertaking, in collaboration with the Original Equipment Committee of the Tire Manufacturers' Division, educational work among such manufacturers to correct this undesirable practice.

On June 18 the Tire Executive Committee held its regular monthly meeting at the Lotos Club, New York, N. Y. The following additional balloon tire sizes and markings were recommended as standard practice for the industry: 33 by 6 (6/21) for 31 by 5 rim; 30 by 4.75 (4.75/21) for 29 by 4 rim; 31 by 4.40 clincher balloon tire.

The Specification Committee of the Mechanical Rubber Goods Manufacturers' Division met in Akron on June 18 and discussed the requirements of a number of the specifications issued by individual railroads and governmental departments.

The most important action taken was the adoption, jointly, with a committee representing the Brass Hose Fittings Manufacturers' Association, of standard sizes and types of couplings for rubber hose commonly purchased by the government, which will be recommended to the Federal Specifications Board, at Washington, for approval.

The Mechanical Rubber Goods Manufacturers' Division is experiencing gratifying success in its efforts, through advertisements in the hardware trade papers, to effect the standardized use of the 5/8-inch garden hose, with the ultimate elimination of the 1/2 and 3/4-inch hose.

Of 920 responses received from hardware jobbers throughout the country, only 13 expressed disapproval of the plan. Of that thirteen, seven gave reasons why the other sizes are needed in their localities. The remaining six state that they are not in favor of the plan. This practically unanimous endorsement, with the approval of the National Retail Hardware Association and the National Hardware Association, the dealers and jobbers organizations, respectively, is most gratifying, and should be of material assistance to the manufacturers in making the plan a success.

For years, considerable trouble and expense have been caused by purchasers who buy according to their own specifications. The Mechanical Rubber Goods Manufacturers' Division has adopted a recommendation that no samples be furnished on such orders. This policy is strengthened by the recent action of the Federal Purchasing Board, at Washington, in approving that principle.

The Toy Balloon Manufacturers' Section of the Rubber Sundries Manufacturers' Division held a regular meeting at the Wooster Country Club, Wooster, Ohio, on June 19. A report was rendered by the sub-committee of the section, collaborating with the association's accounting department in the formulation of uniform cost accounting fundamentals for toy balloon manufacturers. It is expected that final consideration will be given this matter at the next meeting, which is to be held in Ravenna, Ohio, in September.

Thought is being given by the Rubber Sundries Manufacturers' Division to some cooperative educational publicity work on the use of rubber goods in the home. It is expected that some definite action will be taken on this matter in the near future.

The Foreign Trade Division has just begun a campaign to bring about the use of the new domestic 90-day warranty in Cuba, Porto Rico, Jamaica, the Philippines, and in England. The tire adjustment privilege has been abused in these markets, and the Foreign Trade Division hopes to correct that condition by the introduction of the 90-day warranty.

The regular monthly meeting of the Hard Rubber Manufacturers' Division will be held at the Yale Club, New York, N. Y., on June 26. It is expected that at this meeting final action

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

	Pneumatic Casings				Inner Tubes				Solid and Cushion Tires			
1922	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
Twelve months, 1922	..	58,401,086	30,698,139	29,221,899	..	72,463,938	38,137,181	36,656,435	..	2,320,650	786,603	688,845
Twelve months, 1923	..	67,448,419	33,933,936	32,991,810	..	87,807,770	45,128,083	43,554,963	..	3,013,674	692,148	690,090
1923												
April	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	10	260,631	71,468	72,509
May	57	6,906,694	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,1[illegible]
June	55	7,040,600	2,956,943	2,502,185	54	8,924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July	54	6,471,124	1,992,989	2,539,425	52	7,527,281	2,666,354	3,942,247	10	263,891	42,345	45,219
August	58	6,058,387	2,355,915	2,807,432	53	6,950,578	3,577,922	4,304,034	10	262,810	48,141	45,925
September	60	5,397,557	2,009,581	2,623,775	55	6,457,455	3,254,575	3,683,574	10	249,379	37,074	45,971
October	59	4,876,352	2,361,340	2,819,583	55	6,898,425	3,855,244	3,595,737	10	234,945	37,285	48,065
November	55	4,689,329	2,399,725	2,456,296	53	6,663,639	3,451,716	3,422,426	11	213,686	32,577	49,471
December	56	4,329,300	2,437,148	2,603,617	52	6,318,446	3,288,665	3,497,472	10	178,088	34,937	62,408
1924												
January	56	4,808,084	3,220,292	2,838,570	51	6,720,247	3,887,959	3,542,500	10	182,782	53,604	47,295
February	55	5,265,133	3,278,674	2,866,626	50	7,339,307	4,067,631	3,397,668	10	188,519	60,646	52,965
March	57	5,763,084	3,427,692	2,990,872	53	8,157,704	4,218,950	3,500,105	10	203,608	68,662	61,482
April	60	6,164,226	3,307,478	3,013,441	54	8,627,343	4,035,242	3,586,279	10	212,419	69,534	58,486

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis or abroad.

(Compiled by The Rubber Association of America, Inc.)

will be taken respecting minimum quality standards for hard rubber radio sheet.

On June 30, the Association will distribute to rubber manufacturers, rubber reclaimers and crude rubber importers and dealers, its questionnaire calling for information relative to the rubber industry, during the second quarter of 1924. It is expected that the response to the questionnaire will be quite as gratifying as for the first quarter of the year.

THE NEW REVENUE LAW

The new law, which becomes effective July 2, 1924, involves some important changes.

Automobile trucks, automobile wagons and other automobiles are not taxed as complete vehicles but instead the chassis and the body composing the vehicle are subject to tax. An automobile truck or wagon chassis sold by its maker at more than $1,000 is taxed at 3 per cent on the entire price. Bodies for such automobile trucks or wagons selling for more than $200 are taxed 3 per cent on the entire price.

The same rules apply to passenger cars. The passenger car manufacturer buying the body will find that his body maker pays the tax when the sale is made, and when the complete passenger car is sold by its maker, the tax involved is that on the chassis.

Tires, inner tubes, parts and accessories are treated as under the previous law, except the tax rate is now 2½ per cent instead of the old 5 per cent. However, by definition, the terms parts and accessories do not include chassis or bodies.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(421) We are asked to advise as to best method of cleaning molds.

(422) Inquiry is made concerning a machine for wrapping golf balls in wax paper.

(423) We are asked for addresses of manufacturers of slag wool.

(424) Information is asked concerning source of supply of red rouge for hard rubber.

(425) We are asked where the necessary equipment, such as chases, pads, type, etc., for printing on rubber toy balloons may be obtained.

(426) We are asked for names of manufacturers of vacuum cups.

(427) Information is asked concerning "Reddco" linen lined hose.

(428) Inquiry is made concerning rubber grommets for wire insulation in automobile construction.

(429) We are asked for names of manufacturers of equipment for making rubber heels.

(430) Information is asked as to source of supply of fire hose cappers.

(431) Addresses are desired of firms handling hydrometer bulbs and nozzles, also glass bowls and hydrometer floats.

(432) Inquiry is made for a battery jar polishing machine.

(433) We are asked for a list of manufacturers of hose building machinery.

(434) Subscriber desires names of manufacturers of machines for wrapping hose and tubing.

(435) We are asked where rubber molds may be obtained.

(436) Address is requested of manufacturer of a machine for applying solid tires to carriage wheels.

(437) Inquiry is made for addresses of firms making puncture-proof inner tubes.

(438) Names of firms supplying a high and cheap grade of hollands are requested.

(439) Inquiry is made concerning makers of aluminum molds.

(440) We are asked for address of firm making a machine for painting the inside of tire casings with whitewash.

(441) A list of manufacturers of plain rubber bulbs is requested.

(442) We are asked for information concerning a non-breakable rubber button for bathing suits.

(443) Addresses are requested of manufacturers of shoe last lathes.

(444) Request is made for a list of manufacturers of sponge rubber.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

Number	Country and Commodity	Purchase or Agency
10,328	Hungary—Tires	Purchase and agency
10,348	Austria—Rubber boots and shoes	Purchase and agency
10,351	France—Best cord tires; well known makes; also repair and replacement material	Agency
10,352	Netherlands—Best quality rubber waist belts	Purchase
10,358	Austria—Automobile and motorcycle tires	Agency
10,385	China—Tires	Purchase and agency
10,442	Germany—Tires	Agency
10,446	Austria—Automobile, truck and motorcycle tires	Agency
10,467	Japan—Round rubber bands	Agency
10,512	Ireland—Tire casings	Purchase and agency
10,572	Germany—Tires	Purchase
10,602	Austria—Tires	Agency
10,603	Crêpe rubber soles or uncut crêpe sheets	Purchase and agency
10,604	Austria—Surgical rubber goods	Purchase and agency
10,605	Germany—Automobile, motorcycle and bicycle tires	Agency
10,606	Norway—Conveyor belting 155 meters long and one meter wide	Purchase
10,607	Italy—Sundries and specialties	Purchase and agency
10,608	Italy—Tire for automobiles, motorcycles and bicycles	Purchase and agency

FOREIGN RUBBER TRADE INFORMATION

A series of special circulars, containing brief items of interest regarding the rubber industry in various foreign countries, is now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. As a rule each of these publications contains a number of items, although some are devoted to a more detailed account of the rubber industry in some one country. Those of the latter class mentioned below are marked with an asterisk.

Number	Special Circular
482	"Tire Market of San Jose, Costa Rica," etc., etc.
*483	"German Competition Less Severe in Argentine Sundries Trade."
*486	"United States Imports of Rubber Tires."
*487	"Market for Tires in the Anglo-Egyptian Sudan."
489	"Export Trade Notes on Water Bottles and Syringes," etc., etc.
*490	"Retail Tire Prices in Dutch East Indies."
*492	"Market for Rubber Footwear and Waterproofed Clothing in Rumania."
*495	"Retail Tire Prices in British South Africa."
497	"Tire Market of Matanzas, Cuba," etc., etc.
498	"Statistics of the Rubber Producing Regions of the Middle East, and Imports and Reexports of Crude Rubber of the United Kingdom."
*500	"Retail Tire Prices in Denmark."
*501	"Retail Tire Prices in Uruguay."
504	"Balloon Cord Prices in Hamilton, Ontario," etc., etc.
*505	"Canton Market for Raincoats."
506	"Export Trade Notes on Water Bottles and Syringes," etc., etc.
*507	"Retail Tire Prices in Chile."
509	"Export Trade Notes on Rubber Footwear," etc., etc.
511	"Market for Water Bottles and Syringes in Basse-Terre, Guadeloupe," etc., etc.
512	"Market for Water Bottles and Syringes in Lima, Peru," etc., etc.
*513	"Market for Canvas Rubber-Soled Footwear in Italy."
515	"Market for Tires in San Luis Fotosi, Mexico," etc., etc.
*516	"Market for Canvas Rubber-Soled Footwear in Belgium."
*517	"Market for Canvas Rubber-Soled Footwear in British South Africa."
518	"Market for Rubber Belting in Indo-China."
519	"Tire Market in La Paz, Bolivia," etc., etc.

News of the American Rubber Trade

Rubber Industry Outlook

INDUSTRIAL operations generally continue to slacken in volume. The rubber industry is no exception; consequently its outlook today exhibits no improvement over that of a month ago. Manufacturers have diminished their rate of output rather than increase their inventories while commodity markets are weak and the business outlook uncertain.

The major part of the rubber industry, dependent upon the manufacture and use of motor vehicles, has been obliged to curtail operations earlier in the year than usual because the automobile industry operated during the first quarter at a record rate while retail sales of cars slowed down.

Car production this year reached its peak at the end of the first quarter. Peak production but slightly less in amount was attained two months earlier than in 1923 and far outstripped the record rate of 1922, which came three months later that year. The May rate of car production fell practically to that of December, 1923. This curtailment forced downward the production schedules of tire and automobile topping manufacturers, whose curtailment is now reacting in restriction of demand on crude rubber, textiles and compounding ingredients.

Statistics at hand show the volume of manufactured rubber goods trade as 17.2 per cent less for the first quarter of 1924 than for the corresponding period of 1923. Of this shrinkage 11.6 per cent was sustained on goods dependent on the automobile industry, while 5.6 per cent was the share borne by production in all other divisions of the trade.

Competitive effort on the part of leading tire producers to stimulate balloon tire sales by giving away wheels to dealers has resulted in a cut of virtually 15 per cent. In what degree this concession will stimulate tire sales is yet to be demonstrated. Interest in balloon tires is unquestionably increasing among automobilists but it seems doubtful if the majority, mindful of upkeep economy and resale values, are willing to discard serviceable wheels and tires to make the change to balloon tires.

This cut in tire prices entails a heavy loss of profit to manufacturers and still leaves the "gyp" ample margin for profitable activity.

Financial

The Fisk Rubber Co.

The Fisk Rubber Company reports net sales of $23,200,000 for their six months' period ended April 30, 1924, with operating profits of $1,453,923 after depreciation but before interest and Federal taxes. After interest and Federal taxes they carried to general surplus $754,760.

As a result of The Fisk Rubber Co.'s policy of restricting dealers' spring shipments for their actual requirements only, thereby preventing excessive stocks as occurred in 1920-1921, they appear to be in line for a very satisfactory business in the selling months to come.

United Shoe Machinery Corporation

The United Shoe Machinery Corporation has declared quarterly dividend of 62½ cents per share on its common stock, payable July 5 to stock of record June 18. The company had been paying 50 cents quarterly. The regular quarterly dividend of 37½ cents per share on preferred was declared payable July 5 to stock of record June 18.

The company reported the second largest earnings in its history in the fiscal period ended February 28, 1924. Operating profits amounted to $8,054,941. Only once was this exceeded, in 1917, when operating net amounted to $8,174,452. Compared with profits of $6,547,215 in the 1922-23 fiscal year, earnings just reported show an increase of $1,507,726, or over 23 per cent. Measured against net of $3,019,871 in the fiscal year ended February 28, 1917, the increase is over 100 per cent.

After dividends of 6 per cent on the 423,729 shares of preferred stock of $25 par and reserves for taxes and contingencies, final 1923 net amounted to $6,416,348. This was equivalent to $3.30 per share on the 1,941,555 shares of common against per share profits of $3.18 in 1922.

Mason Organization Increases Sales

Gross sales made by The Mason Tire & Rubber Co., Kent, Ohio, have increased from $300,000 during the month of last November to a total for the first four months of 1924 of over $3,500,000, or an average of about $900,000 per month this year. This would mean an annual rate of $10,800,000, as against $7,000,000 in 1923. The company's financial position is considered very satisfactory, the ratio of current assets to current liabilities being about 2½ to 1. April sales this year totaled $958,000, with net profit for the month of $42,000, while May sales and profits will show still further improvement.

Westinghouse Capital Stock Increased

The authorized capital stock of the Westinghouse Electric & Manufacturing Co. was increased from $125,000,000 par value to $200,000,000 par value at a meeting of the stockholders held June 11. Directors, as follows, were elected:

Of the class whose term will expire the second Wednesday of June, 1928: Guy E. Tripp, chairman of the board, Westinghouse Electric & Manufacturing Co.; H. H. Westinghouse, chairman of the board, Westinghouse Airbrake Co.; Joseph W. Marsh, president, Standard Underground Cable Co., and Albert H. Wiggin, president, Chase National Bank of New York.

Of the class whose term will expire the second Wednesday of June, 1925: H. P. Davis, vice-president, Westinghouse Electric & Manufacturing Co. Of the class whose term will expire the second Wednesday of June, 1927: L. A. Osborne, vice-president, Westinghouse Electric & Manufacturing Co. Mr. Osborne and Mr. Davis are new directors elected to fill vacancies created on the board by retiring of James C. Bennett and William H. Woodin.

Akron Rubber Stock Quotations

Quotations of June 21 supplied by Otis & Co., Cleveland, Ohio.

	Last Sale	Bid	Asked
Firestone com.	68¼	...	68½
Firestone 1st pfd.	96	96	97
Firestone 2nd pfd.	86	...	86
General com.	175	...	185
General pfd.	98	...	100
Goodrich com.	24½	...	...
Goodrich pfd.	76	...	...
Goodyear com.	10	...	10¼
Goodyear pfd.	45⅞	44¾	46
Goodyear pr. pfd.	...	...	...
Kelly-Springfield com.	36	...	...
Kelly-Springfield pfd.	118	...	...
Kelly-Springfield 2nd pfd.	...	...	...
McGraw com.	⅛	...	...
McGraw pfd.	¼	...	⅜
Miller com.	68	66	...
Miller pfd.	93¼	93	94
Star com.	9	...	...
Star pfd.	30	...	...
Swinehart	16	...	20
Victor com.	2	...	2
Victor pfd.	...	...	...

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Canadian Consolidated Rubber Co.	Pfd.	1¾% q.	June 30	June 23
Firestone-Apsley Rubber Co.....	Pfd.	3½% s.a.	July 1	June 27
General Tire & Rubber Co.....	Pfd.	1¾% q.	July 1	June 20
Goodyear Tire & Rubber Co.....	Pr. Pfd.	2% q.	July 1	June 20
Goodyear Tire & Rubber Co. of Canada	Pfd.	1¾% q.	July 2	June 14
India Tire & Rubber Co.....	Com.	$1 q.	July 1	June 20
India Tire & Rubber Co.....	Com.	(extra) 50 cts.	July 1	June 20
India Tire & Rubber Co.....	Pfd.	$1.75 q.	July 1	June 20
Paul Rubber Co.....	Pfd.	4% s.a.	.....	.....
Servus Rubber Co.....	Com.	3%	July 15	June 1

New York Stock Exchange Quotations

June 23, 1924

	High	Low	Last
Ajax Rubber, com.....	6⅛	6	6
Goodrich, B. F., Co., com.....	18	18	18
Goodyear Tire & Rubber, pfd.....	45¼	45¼	45¼
Goodyear Tire & Rubber, pr. pfd. (8).....	93½	93½	93½
Kelly-Springfield Tire, com.....	10¾	10¼	10¾
Keystone Tire & Rubber, com.....	1⅝	1⅝	1⅝
United States Rubber, com.....	25⅞	25½	25½
United States Rubber, 1st pfd. (8).....	74	73⅜	74

New Incorporations

Cities Tire & Rubber Co., The, May 14 (Ohio), $10,000. Ward H. Parry, president, 33 Corson Ave.; Walter R. Kreinheder, executive vice-president and treasurer, and Mildred I. Kreinheder, secretary, both of 27 North Forge street, and all of Akron, Ohio. Principal office, Ohio Savings and Trust Bldg., opposite Goodyear, Akron, Ohio. To manufacture and deal in tires, uncured carcasses and raw repairing materials.

Feinblatt-Weintraub, Inc., May 23 (New York), $10,000. Incorporators: Jos. Weintraub and Ruth Weintraub, both of 864 Fox street, Bronx, and Lillian Berlin, 277 Broadway, New York City. Principal office, Manhattan. To manufacture rubberized and waterproof fabrics.

Ideal Tire & Rubber Co., The, May 8 (Ohio), $500,000 bond issue and 50,000 shares of common stock of no par value. F. C. Thornton, president, 1852 Roxbury Road; D. T. Kelliker, vice-president, 3116 West 12th street; Mrs. G. Smith Kennedy, vice-president, 12008 Ashbury avenue; J. A. Parfitt, manager; all of Cleveland; A. G. Cowden, secretary, 1247 Arthur avenue; Fred Bigler, treasurer, 1463 Wyandotte avenue, both of Lakewood; all of Ohio. Principal office, Warner Road, Cleveland, Ohio. To manufacture tires, tubes and mechanical goods.

Jones-Barr Motor Co., February 1 (Iowa), $25,000. H. A. Jones, president; Robert Barr, secretary and A. B. Jones, treasurer. Principal office, Cherokee, Iowa. To buy and sell automotive equipment and handle rubber goods, such as tires, accessories, etc.

King Emergency Tire Co., The, May 24 (Delaware), $100,000 par value $10. Incorporators: Franklin L. Mettler; M. E. Mettler and P. M. Gilkey, all of Wilmington, Delaware. Principal office, with Franklin L. Mettler, 832 Market street, Wilmington, Delaware. To manufacture and distribute emergency automobile tires.

Mainardy Rubber Co., The June 11 (Delaware), $100,000 preferred, par value $100, and 2,000 shares of common stock without nominal or par value. Incorporators: Samuel C. Wood; Harry C. Hand and Raymond J. Corman, all of 65 Cedar street, New York City. Principal office, with the United States Corporation Co., Dover, Delaware. To manufacture and deal in inner and outer tubes.

Miller-Gross Rubber Co., Inc., May 23 (New York), $10,000. Incorporators: H. T. Miller and B. F. Miller, both of 2325 15th street and Wm. A. Gross, 309 8th street, all of Troy, New York. Principal office, Troy, New York. To carry on a tire business.

North-Eastern Tire & Rubber Works, Inc., January 2 (Maryland), $25,000 divided in $12,500 of preferred and $12,500 of common stock at $10 per share. William N. Saneman, Jr., president; William N. Saneman, Sr., treasurer, and John J. McCusker, attorney-secretary, all of Baltimore, Maryland. Principal office, 1982 N. Jay street, Baltimore, Maryland. To manufacture reliners and blowout patches and to buy and sell scrap rubber.

Perfection Tire Sales Co., Inc., April 10 (Rhode Island), 500 shares of common stock, without par value. Incorporators: Joseph P. Ryan; Aloysius E. Ryan and James F. Sullivan, all of Providence, Rhode Island. Principal office, Providence, R. I. To deal in tires.

Spade Tire Co., April 10 (Michigan), $25,000 subscribed, and $15,500 paid in. Ira N. Spade, president and director; G. M. Spade, vice-president and director, and Vincent G. McCourt, secretary, treasurer and director, all of Grand Rapids, Michigan. Principal office, 7 Fulton street, West, Grand Rapids, Michigan. To carry Goodyear solid and pneumatic tires.

Summit Tube Garage, Inc., April 19 (New Jersey), $50,000. Incorporators: Samuel Neufeld, 2068 61st street; William Friedman, 1259 Lincoln Place, both of Brooklyn, New York, and Leo Blumberg, 15 Exchange Place, Jersey City, N. J. Principal office, 15 Exchange Place, Jersey City, N. J. To carry on the business of garagemen and automobile dealers.

Syracuse Vulcanizing Co., Inc., May 29 (New York), $5,000. Incorporators: Richard Palmer, 2429 South Salina street; Philip A. Goettel, 201 Kirkpatrick street, and Horwood V. Jones, all of Syracuse, N. Y. Principal office, Syracuse, New York. To deal in tires, automobiles, etc.

Tomkins Moulded Rubber, Inc., May 20 (Delaware), $50,000 preferred, par value $100, and 2,500 shares of common stock without nominal or par value. Incorporators: T. L. Croteau; M. A. Bruce and A. M. Hooven, Wilmington, Delaware. Principal office, with the Corporation Trust Company of America, Du Pont Bldg., Wilmington, Delaware. To manufacture and deal in rubber goods of all kinds.

Williamson Battery Co., May 26 (Delaware), 5,000 shares preferred stock, par value $100, and 200,000 shares of common stock without nominal or par value. Incorporators: T. L. Croteau, M. A. Bruce and A. M. Hooven, all of Wilmington, Delaware. Principal office, with the Corporation Trust Company of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in dry cell and other electric batteries and electric machinery.

Rubber Trade in the East and South

Manufactured Goods

Seasonal conditions combined with complex industrial forces and political uncertainties have resulted in reduced demand in most lines of rubber goods. Some factories are affected more by one set of influences than by others. For example, tires, tubes, and automobile topping are severely restricted in production by failure of the public to purchase automobiles at the estimated rate. It is anticipated that the recent cut in tire prices, direct and indirect, will stimulate the buying interest of motorists in the purchase of tires and particularly of balloon tires.

Heel production has declined materially, to about 25 per cent capacity output, due to parallel causes in the leather shoe industry. One large producer of heels recently ceased operations for two weeks. In the case of rubber boots and shoes, factories are facing seasonal slackness and closing for repairs and summer vacation period for operatives. Mechanical lines show better prices and more activity. Factory operations approximate two-thirds to three-quarters capacity. Flooring as a specialty is interesting an increasing number of manufacturers as affording heavy volume at good prices.

The long and active period in insulated wire production seems to be closed, the mills generally running on not much above half capacity. Weather proofing is in its dull season. Druggists' sundries are in good production, particularly in such items of non-seasonal use as dress shields, baby pants, gloves, hospital supplies, etc. A price war is the current unpleasant feature in this branch be handled in the name of the R. T. Vanderbilt Co. by its various branches.

Vanderbilt Organizes Clay Company

The R. T. Vanderbilt Co., 50 East 42nd street, New York, N. Y., has organized the North American Clay Co., for the purpose of expanding its mining operations and increasing the output of "Dixie" clay. New equipment is being installed at the company's plant, where the capacity is to be doubled. R. T. Vanderbilt is chairman of the board of directors of the North American Clay Co. Sales of "Dixie" clay will as formerly be handled in the name of the R. T. Vanderbilt Co.

International Acceptance Bank Heads German Loan

Some of the leading banking institutions of New York, Boston and Chicago have formed a syndicate headed by the International Acceptance Bank, Inc., of New York, in order to place at the disposal of the new German Gold Rediscount Bank, organized by Dr. Hjalmar Schacht, a credit under which German two-name trade bills, issued in dollars, and payable in the United States, will be taken for rediscount by the American banking syndicate.

New York

The Vulcanized Rubber Co., Inc., manufacturing hard rubber goods of every description, and with main offices at 251-255 Fourth avenue, New York, N. Y., is constructing a one-story addition to its plant at Morrisville, Pennsylvania. This extension, measuring 40 by 132 feet, will be completed about July 15, when other improvements will be under consideration. Judson Drayton is treasurer.

V. G. Thomas, treasurer of L. H. Butcher & Co., Inc., 251-255 Front street, New York, N. Y., has returned from a trip through the South and Middle West, where he visited leading color and chemical concerns. Mr. Thomas reports encouraging prospects for his industry, and the establishment of seven agencies.

The Wamsutta Mills, New Bedford, Massachusetts, which since 1846 has been engaged in the manufacture of cotton products, is now specializing in the production of wide and narrow fabrics for the rubber trade. A special fabric department has been organized by the company's sales agent, Ridley Watts & Co., 44-46 Leonard street, New York, N. Y., and George W. Gibbs, formerly with the Hodgman Rubber Co., has been placed in charge.

William E. Peck & Co., Inc., has been merged with the American Trading Co., 25 Broad street, New York, N. Y. The new concern will carry on business as the American Trading Co., Inc., the only change being the appointment of William E. Peck as a director and vice-president.

David Moffat, manager of the rubber department of Balfour, Williamson & Co., 67 Wall street, New York, N. Y., has been connected with the company's rubber division for a considerable time. He has been spending a year in the Far East studying conditions in the rubber industry, particularly in Singapore and Java.

Louis W. Dumont, formerly of Pell & Dumont, Inc., began on June 1 to conduct business as a crude rubber broker under the name of L. W. Dumont & Co., at 132 Front street, New York, N. Y.

The Lee Tire & Rubber Co. of New York, Inc., 33 West 60th street, New York, N. Y., has appointed H. L. Pettingell as assistant sales manager. Harry E. Field is general sales manager of the organization.

A new company under the name of Currier Loomis has been formed with offices at 39 Cortlandt street, New York, N. Y., for the purpose of marketing a swing joint under the trade name of "Loomis." This type of joint, which is familiar to the rubber industry, represents in its new form an improvement in manufacture, but no change in principle. Mr. Loomis as an engineer has specialized in the celluloid and plastic industries, having been formerly connected with Franklin Williams, Inc., Newark, New Jersey.

At the annual meeting of the stockholders of the Ajax Rubber Co., Inc., 218-222 West 57th street, New York, N. Y., F. M. Hoblitt, vice-president in charge of sales, was also elected a director, succeeding L. P. Destribats. G. E. Shipway is vice-president and general manager and also a director, while Edward L. Fries is secretary-treasurer, vice-president, and also a director.

A. A. Garthwaite, treasurer of the Lee Tire & Rubber Co., when asked about the company's business said: "Increasing orders for the past 45 days have necessitated operation at the Conshohocken plant at full night and day capacity. Since the company secures the bulk of its volume on replacement business the late spring and inclement weather naturally retarded consumer buying. With the coming of automobile weather the Lee factory has struck its accustomed stride and indications point to an outstanding year of business."

The Export Division of the United States Rubber Co., 1790 Broadway, New York, N. Y., has recently appointed H. S. McPherson as manager of the company's branch at Tokio, Japan. Albert N. Reeves goes to Mexico City, Mexico, to act as assistant to the branch manager there, S. L. Carrico.

Albert V. W. Tallman and G. Edward Habich have formed a partnership known as Tallman & Habich, with offices at 35 Stone street, New York, N. Y., and will conduct a brokerage business in crude rubber and kindred products.

On July 1 Neal G. Adair joined the staff of the Motor and Accessory Manufacturers' Association as manager of the Show Department, and also the association's educational and publicity work. Mr. Adair has been editor of *Motor World*, and for several years executive secretary of the National Association of Automobile Show and Association Managers.

Improved facilities for service to the trade have been secured by the removal by The B. F. Goodrich Rubber Co., Akron, Ohio, of its Buffalo, New York, branch from 1052 Main street to the Larkin terminal warehouse, 197 Van Rensselaer street.

On July 1 E. H. Johnson will sever his connection with The Atlantic Insulated Wire & Cable Co., where he has served as vice-president and works manager since the establishment of the company in 1902. Following the recent merging of the Atlantic organization with The Rome Wire Co., the operating equipment of the former concern will be moved to Rome, New York.

G. M. Moffett has been appointed sales service manager of the United States Rubber Co. branch at Rochester, New York.

New equipment is being installed and production will soon begin at the plant of the Syra-Cord Tire & Rubber Corporation, Syracuse, New York, where the products of the Syrabord Rubber Flooring Corporation will be manufactured. The latter company was formerly known as the Reinforced Rubber Flooring Corperation. Prospects for the new industry are said to be very satisfactory. Walter R. Stone is president.

Eastern and Southern Notes

The Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, has received an order from the city of Philadelphia, Pennsylvania, for 50,350 feet of double jacketed fire hose, the largest order ever placed by that city for such equipment. The Stockwell Rubber Co., Inc., 535 Arch street, Philadelphia, was instrumental in securing the new outfit.

John T. Spicer, formerly sales manager of the Thermoid Rubber Co., Trenton, New Jersey, is now connected with the Aitkin-Kynett Co., advertising specialists of Philadelphia.

Lambert Reed, salesman for the Lambertville Rubber Co., Lambertville, New Jersey, in the South, will now cover West Virginia and Pennsylvania.

The E. E. Dew Tire Co., handling Seiberling, Star and Goodyear tires and tubes, has moved to new quarters at 407 Market street, Chattanooga, Tennessee.

The Tire Co., 248 Meeting street, Charleston, South Carolina, is handling Diamond tires at wholesale, and retailing both Goodrich and Diamond casings.

Firestone tires, both pneumatic and solid, are being carried by the Capital City Tire & Supply Co., 284 Peachtree street, Atlanta, Georgia. M. D. Barnes is manager.

The newly organized Rubber Clearing Corporation, 1126 Fourth avenue, South, Nashville, Tennessee, is selling to dealers, at wholesales prices only both Holyoke tires and tubes and Cupples tires. The company is covering the territory included in southern Kentucky, Tennessee and northern Alabama. Officers are: R. G. Ray, president; R. L. Rawls, vice-president; and H. M. Bishop, secretary and treasurer.

The Rubber Products Co., Inc., Fort Worth, Texas, manufactures blowout patches, and also machinery for reclaiming fabric from used automobile tires, tube vulcanizing equipment, etc. Tires in the 30 by 3 and 30 by 3½ sizes are also rebuilt, while a considerable business is done in the manufacturing of rubber specialties. Executives include the following: N. T. Mazza, president; L. G. Colburn, vice-president; G. W. C. Lee, secretary; and C. D. Gibbs, treasurer.

The Ewart-Brewer Co., 419-23 South 21st street, Birmingham, Alabama, is carrying a full line of Century tires, including balloons and balloon types. W. P. Brewer heads the Birmingham organization, and W. E. Ewart is general manager.

A full line of Goodyear and Mohawk tires as well as accessories will be carried by the Service Tire Co., Fifth and Jefferson streets, Paducah, Kentucky, successor to the Ray Winter Tire Co. Executives of the new concern are William R. Burnett, W. D. Payne and Ray Strittmatter, the latter being general manager.

The branch maintained by The B. F. Goodrich Rubber Co., Akron, Ohio, at San Antonio, Texas, has been moved to 635 Soledad street.

General Manager Pennsylvania Rubber Co.

George Washington Daum, vice-president of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, and who has succeeded the late Seneca G. Lewis as general manager of that company, has had a long and varied experience in the rubber industry, to which he has devoted his entire business life.

George W. Daum

Born in Canton, Ohio, in 1885, he was educated in the public schools of Akron, that state, and in 1900 went to work for The B. F. Goodrich Co. as order clerk. Advancing through the sales department and mold records he became assistant department manager, a post in which he acquired experience of no little value in his later work.

In 1909 he joined the Pennsylvania Rubber Co. as manager of the cost department and thereafter held successively the offices of assistant superintendent, superintendent, assistant general manager and vice-president-general manager, to which latter office he was appointed April 21, 1924. Thus he has long been an important factor in the company's growth of business.

Mr. Daum is a Mason, an Elk and a member of the Pittsburgh Athletic Club, Greensburg Country Club, Hannastown Golf Club and Westmoreland Polo Club.

The Rubber Trade in New Jersey

Manufactured Goods

Generally speaking the industry is operating on reduced tickets usually in force at this time of the year. While a few Trenton rubber manufacturers are operating overtime to fill orders, others report business as dropping off somewhat. At one plant more than 300 hands were laid off during the past month when orders took a sudden drop. The lay-off is believed to be only temporary. The tire industry shows lower production and sales and increased stocks on hand for the first four months of 1924 as compared with the similar period of 1923. The temporary slump in the manufacture of tires is believed to be due to the long season of rain and inclement weather. Manufacturers of rubber cloth say they have no cause for complaint.

Long Service Rubber Men Honored

The Trenton rubber plants were well represented at the banquet given at the Trenton armory on June 7 to all employes with twenty-five years or more of service to their credit. The Crescent Insulated Wire & Cable Co. led the list with forty-five veteran employes, while the Murray Rubber Co. had forty. Other concerns and number of old employes present included: Essex Rubber Co., twenty-two; Luzerne Rubber Co., twelve; Whitehead Brothers Rubber Co., twelve; Thermoid Rubber Co., twenty; Home Rubber Co., eighteen; Mercer Rubber Co., fourteen, and the William R. Thropp Co., thirteen.

Lambertville Rubber Co. Under Owner Management

Thomas R. Shepard has been appointed by the board of directors general manager of the Lambertville Rubber Co., Lambertville, New Jersey. The contract with the Stevenson Corporation terminated recently and the plant is again under owner management. Mr. Shepard represents the major financial interest which controls the Lambertville concern. C. E. Murray, general manager for the past five years, will continue his supervision until Mr. Shepard becomes thoroughly acquainted with his new duties.

The regular summer shutdown is scheduled from July 21 to August 11, when repairs to machinery will be made. H. B. Smith, employment manager, has been made a member of the sales force. Kenneth B. White has been selected as employment manager.

De Mattia Bros. Increase Manufacturing Facilities

De Mattia Bros., Garfield, New Jersey, announce the completion of a plan for further business expansion. De Mattia Brothers, Inc., will continue to operate the machine shop in Garfield, where a full line of tire molds, mechanical molds, machinery and the universally known De Mattia core chuck are manufactured. The foundry in Clifton, New Jersey, will be operated by the De Mattia Foundry & Machine Co., where separate offices will be maintained, continuing to specialize in gray iron castings.

All organization plans have been completed, wherein controlling interest in each company will continue to be held by Peter De Mattia and Barthold De Mattia, who will also be executive heads of both companies.

Trenton Tire Dealers' Banquet

The first annual banquet of the Trenton Tire Dealers' Association, held on June 19, at Hillwood Inn, Trenton, N. J., was a decided success. Twenty-two members and guests were present. There were vocal and instrumental selections and music by an orchestra. Following the banquet there was a general discussion on tires.

New Jersey Notes

F. Robert Lee has been advanced to the position of general sales manager of the Thermoid Rubber Co. to succeed John T. Spicer, resigned. O. H. Smith has been made assistant general sales manager. Mr. Lee was formerly assistant sales manager.

Jos. O. Stokes is spending the summer at his beautiful home in Santa Monica, California, and W. G. B. Stokes is summering at Atlantic City, New Jersey. Each of the brothers claims to have found the ideal climate in which to pass the heated term.

The Howe Rubber Corporation, New Brunswick, New Jersey, announces that operations will be resumed after a shutdown of several weeks. George M. Griffith, president, says that no new equipment will be installed for the manufacture of balloon tires and that the concern will continue the manufacture of standard lines. The cost accounting system is now being simplified. Orders are being received and there will be a rearrangement of the office personnel. The resignation of H. M. Kerr was accepted as secretary and treasurer and as a member of the board.

The Thermoid Rubber Co. reports marked increase in the manufacture of tires, with a dropping off in the brake lining production. The latter department was very busy until a short time ago.

A number of hands have been laid off at the plant of the Joseph Stokes Rubber Co., manufacturers of hard rubber goods exclusively. The company specializes in making battery jars.

Whitehead Brothers Rubber Co. announces business as dull in the different departments, including the hose department, which until recently has been busy filling summer orders.

The Puritan Rubber Co., manufacturers of molded goods and rubber cloth, is optimistic over the future judging from the amount of business now being done. The concern recently added a night force.

The Ajax Rubber Co. reports good business with increased orders. The output of balloon tires has been increased during the past month and prospects are excellent for the remainder of the summer. William W. McMahon, general manager, believes the best policy is not to accumulate stock.

The Spartan Rubber Co., Yardville, New Jersey, which had been operating twenty-four hours a day, has been compelled to cut

down on production somewhat. However, the company has placed three shifts at work in one department and one shift in the other departments. The company is producing about 400 tires a day.

The Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, reports an increase of about 50 per cent in tire and tube production during the past month and the company is ready to handle more summer business.

C. Edward Murray, Jr., president of the Murray Rubber Co., Trenton, New Jersey, and Mrs. Murray gave a dinner and dance at their home at Princeton in honor of their tenth wedding anniversary. Forty guests were present.

Henry L. Joyce, vice-president of the Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, was fined $12,500 after pleading guilty to defrauding the Government. Judge English in the Federal Court in New York imposed the fine on Joyce instead of a jail sentence.

The Combination Rubber Manufacturing Co., Trenton, New Jersey, recently removed from Boonton, New Jersey, is now in its modern four story plant at Trenton. The factory adjoins the Hamilton Rubber Manufacturing Co., whose officials control the Combination concern. The company is making Viking balloon tires, besides Viking cords, and production has increased 50 per cent during the past two months. A. R. Colvin is factory manager; F. W. Servis is in charge of the sales, while Fred Conover is in charge of the finances. The following comprise the board of directors: George R. Cook, Horace T. Cook, Henry X. Young, Fred L. Conover, A. R. Colvin, F. W. Servis and A. Boyd Cornell.

The Trenton Tire Rubber Co. has taken over Jemison Brothers, Trenton, New Jersey. The concern handles exclusively Thermoid tires and other products. Thomas Yates and Raymond Furman are officials of the company. Mr. Yates was formerly connected with the Bergougnan Rubber Co.

John Tenney, Jr., has resigned as president of the Howe Rubber Corporation, New Brunswick, New Jersey, and George M. Griffith, an industrial engineer of Cleveland, Ohio, has been chosen to succeed him. Mr. Tenney will continue actively with the Howe company as chairman of the board of directors. Mr. Griffith said that the Howe company would begin operations when the stock on hand had been disposed of; that the concern was not insolvent and that the creditors would be paid 100 cents on the dollar.

P. B. Band Company of New Jersey, 737 Main avenue, Passaic, New Jersey, has been incorporated with $50,000 capital to manufacture transmission bands and other kinds of automobile accessories. The incorporators are: Joseph D. Murray, 400 Main avenue, Woodbridge; Louis J. DeLuca, 49 Henry street, Passaic, and Rudolph Unger, 428 River Drive, Passaic, all in New Jersey.

The Rubber Trade in Rhode Island

The rubber situation in Rhode Island has not been so discouraging in many years as it is at the present time, with little, if any, prospect of immediate relief. This is especially the case as regards the manufacturers of footwear, whose plants are on the shortest working schedules with the smallest working forces since the outbreak of the World War.

Davol Anniversary Dance

Several hundred employes of the Davol Rubber Co. enjoyed a dance Wednesday evening, June 4, in the big new building just completed, extending from South street nearly to the Providence river, in celebration of the 50th anniversary of the founding of the concern in 1874 by the late Joseph Davol. The business now requires a floor space of approximately five acres and the indications are that more will be necessary in a comparatively short time. The affair on June 4 was under the direction of the Employes' Mutual Benefit Association and a committee composed of E. L. Hanna, Thomas Ryan and Paul A. Raiche.

During the evening the gathering adopted resolutions complimenting the concern on its long life and the cordial relations existing between the officials and the employes. The resolutions expressed the appreciation of the employes for the numerous benefits which they enjoy with the company. The annual factory outing this year will be held at Rocky Point on August 23, it was announced during the evening.

Summer Closing of National Factory

At the National India Rubber Co., Bristol, the entire plant is closed, having shut down on June 28 with notice that it will remain idle all summer. Curtailment began here June 10, when the spreading room of the shoe division closed. The next day the cutting department closed and in rotation the other departments closed until June 28 when the entire plant suspended operations.

It was announced June 4 that the shoe division would shut down for about three months and "it is expected that work will be resumed in the latter part of September on a reduced scale of wages." The announcement further stated that "the wire division will also shut down on June 28 and will probably reopen on Monday, August 4."

The following notice to employes was issued by the management:

"All persons living out of town, who are at present employed in the factory, will be given until January 1, 1925, in which to move to Bristol or at least to reside in Bristol during those days of the week in which the factory is in operation. It should be understood, however, that in the cases of clerks, all persons on the salary payroll who have been notified or may be notified that their services are not needed on their present work, in order to be included in this ruling must be willing to accept transfer to work on direct labor in the factory.

"All out-of-town people who have been laid off since February 1 solely on account of their place of residence, and who have not been able to obtain work, will be given work if they move to Bristol prior to January 1, 1925, or during that period prove their willingness to reside in Bristol during the days when the factory is operating.

"All heads of families or wives of heads of families now in our employ who live out of town but who held title to their own houses on June 2, 1924, will be given a period of one year, elapsing July 1, 1925, at which time a further decision will be made.

"Every assistance possible will be given to persons who wish to find houses in which to live or boarding places during this period, and the industrial relations department will be very glad to receive applications promptly from any one who wishes to make use of their assistance."

At the time of the beginning of the shutdown there were approximately 2,100 persons employed in the Keds department and 450 in the wire and mechanical divisions. The shoe division has been operating under a curtailed schedule for the past eight months.

Rhode Island Notes

The American Wringer Co., Woonsocket, on June 20 posted notices that a wage reduction of 10 per cent affecting its nearly 400 employes would go into effect July 7. George R. Keltie, production manager of the factory, states that the cut was made necessary by continued losing of business on account of lower prices. He expressed the opinion that in the fall better business conditions would come.

Mr. Keltie said that the plant normally employed more than 500 hands, but at present carries about 388 on the payroll. He said that some of the departments had been running two days and some three and fours days a week, with none operating full time. He declared that weather conditions had made department store business bad, which resulted in a falling off of business for his concern.

The American Wringer Co. recently announced that it was experimenting with a rubber paving block, some of which were

being tried out on some of the streets of Woonsocket, where they were set under supervision of the American Wringer Co. officials. The blocks are made by special process and it is believed that if they prove all that is expected of them a new line of work will be opened up for the employes. The company has also been experimenting with a new floor covering made of rubber.

The Hope Webbing Co., Pawtucket, which employs about 1,200 persons when all departments are operating on full time, has had less than half its quota at work in all the departments during the last six weeks. Charles A. Horton, general manager of the plant, says that one of the reasons why business is so poor is "the playing of too much politics."

Business has been so unsteady at the Hope Webbing Co. during the last few months that it has been found necessary to lay off employes from time to time, with the result that only about one-half the number ordinarily employed are now working.

"I don't say that business will not pick up later," said Mr. Horton, "but at the present time there is too much playing of politics. We have laid off a number of employes and owing to the unsteadiness of conditions we cannot say at this time whether we will be obliged to let more go indefinitely, or take those who are now out of work."

Creditors of the Walker Webbing Co. about the middle of last month gave their assent to the selling at private sale of the company's property in this state for $130,700 and a decree has been entered by Justice Chester W. Barrows in the Superior Court for Providence County authorizing the receivers, Arthur Henius of this city and E. H. Small of Fall River, Massachusetts, to dispose of the property. The name of the prospective purchaser has been kept secret. The sale does not include the company's holdings at Brockton, Massachusetts, under the terms of the order of notice issued in accordance with the court's decree.

Mr. and Mrs. John Callan, of Bristol, recently celebrated their golden wedding anniversary. He was born in Ireland in 1845 but came to Bristol when he was 18 years old and has remained there ever since. He was in the employ of the National India Rubber Co. for 52 years, where he was an acknowledged expert in vulcanizing of rubber goods. He retired three years ago. The anniversary was held in the house in which Mr. and Mrs. Callan have made their home for 48 years and raised a family of 11 children.

Augustus O. Bourn, treasurer of the Bourn Rubber Co., Providence, and former Governor of Rhode Island, was the oldest alumnus at the 156th annual Commencement exercises at Brown University last month, being a member of the Class of '58.

The Lawrence Felting Co., Millville, closed June 26 for a two weeks' shutdown to allow their workers an annual vacation period and also an opportunity for an overhauling of boilers and machinery.

The capital stock of the Sterling Insulated Wire Co., of Providence, has been changed, according to information filed at the office of the Secretary of State, from 500 shares of common without par value to $30,000 preferred and 300 shares of common without par value.

The American Fabric Co., Inc., Providence, manufacturer of radio and telephone cords, is erecting a new fireproof mill construction building at 46 Baker street, and it is stated that the equipment of the plant will be tripled. The new building will have 13,000 square feet of floor space, with land adjoining for future expansion. The officers of the company are as follows: Jacob Kenner, president and general manager, and Barney Kenner, secretary and treasurer.

AMERICAN EXPORTS OF RUBBER BELTING DURING APRIL INCLUDED shipments to the following countries: British South Africa, which took goods valued at $32,509; England, $28,971; Japan, $23,958; Chile, $21,739; Mexico, $15,856; Australia, $14,218; Canada, $11,184.

The Rubber Trade in Massachusetts

Manufactured Goods

Continued unseasonal spring weather and general business uncertainty have greatly handicapped manufacturers of rubber goods and necessitated curtailed production schedules in most lines. Considerable unemployment exists, reducing the purchasing power of consumers. The tendency toward stabilization of prices of basic commodities and improving weather conditions are regarded as hopeful factors. Retail trade is quite sensitive to weather conditions, and unseasonable weather together with the present retailers' policy of buying only for immediate needs places a heavy burden and risk on the manufacturer.

Rubber footwear factories are operating four or five days a week chiefly on tennis lines and for the most part on orders for immediate delivery. The summer shutdowns, except in a few instances, now promise to be longer than usual.

Tire production is proceeding under pronounced curtailment owing to unusually heavy stocks in the hands of manufacturers and dealers, less motor vehicle buying activity with consequent reduced output, and the fact that the market is flooded with used cars not in operation. The smaller companies with comparatively steady local outlets are perhaps feeling this less than the larger producers.

Mechanical rubber goods demand is only fair and the same may be said of druggists' sundries, seasonal specialties and sporting goods. The output of automobile topping and proofed goods has been somewhat curtailed, and the reclaiming industry is feeling the general quietness, except such firms as have engaged in the manufacture of rubber flooring and other specialties utilizing much of their own reclaim. Building operations continue large and in consequence most insulated wire factories are still operating at or nearly on full time.

Boston May Become Important Rubber Port

If the plans of the Maritime Association of the Boston Chamber of Commerce materialize, crude rubber for the big tire and rubber company's property in this state for $130,700 and a decree has through the port of Boston and shipped throughout the country to its destination.

A party of thirty members of the Rubber Association of America came to Boston not long ago and spent the day in investigating the situation. They were taken to the Army Base and Commonwealth Pier, where they saw the facilities for handling freight from steamers. Then they made a tour of the harbor on a steamer inspecting terminal facilities at East Boston and Charlestown, where more ocean liners dock.

The railroad connections were explained, and the delegation was told that while a steamer was proceeding to New York a cargo of rubber could be unloaded in Boston and be on its way to the factories, and that during the time it would take to unload at New York and be ferried on lighters to some of the railroad terminals, it would be in Akron and other plants.

The delegates were received by Governor Cox at the State House and by Acting Mayor Sullivan at City Hall. Later they were taken to the Country Club at Brookline for lunch as guests of a large party of prominent Boston bankers and business men.

Harvard Bridge to Be Repaired

The Massachusetts Legislature has at last authorized the repair of the existing Harvard Bridge between Boston and Cambridge at a cost not to exceed $600,000. Plans call for elimination of the present draw and have been approved by the War Department. Work will be started soon and hope is entertained by its sponsors that rubber paving will be chosen as the floor covering. In making a selection the authorities will be influenced somewhat by the tryout of rubber paving recently installed on the Northern avenue bridge in Boston. To date this trial installation looks as good as

new and is highly spoken of by drivers of both horse-drawn and motor vehicles.

Canadian Water Power for New England

The power investigating committee of the Associated Industries of Massachusetts, headed by Charles T. Main, the eminent industrial engineer, and of which George L. Finch, power superintendent of the Hood Rubber Co., Watertown, was a member, has rendered in its report a complete summary of the water power situation in New England.

Briefly, the committee finds that there is sufficient undeveloped water power in New England to take care of her growing requirements for several years, not considering the electrification of railroads, but that unfortunately about three-quarters of this undeveloped power is in Maine and under existing laws cannot be exported. It is to sources in Canada, therefore, that she must look for the hydro-electric energy needed to supplement her steam plants, and upon this point the committee says in substance: There are two potential sources of such water power: the large developments on the tributaries of the St. Lawrence in Quebec, in the early construction of which private capital is already engaged, and which can be economically developed in progressive steps, and the still larger developments on the St. Lawrence, which undoubtedly must wait for the international canalization of the river.

It is merely a question of time before the St. Lawrence canal will be constructed. It is possible that permanent power from this source may be available for New England by 1935 or 1940. Somewhat less than 300,000 h.p. of the St. Lawrence river water power is now developed out of the total of 5,000,000 h.p. estimated to be available.

In the meantime, it is to the mutual advantage of both New England and Quebec to promote for their joint use the early development of some of the water powers on the tributaries of the St. Lawrence. The crowded industrial centers in southern New England need this water power, which now runs to waste, and the domestic plants and paper industries of Quebec look to this side of the border for their essential coal, the cost and difficulty of securing which is continually increasing. It is entirely possible to transmit the nearer blocks of Quebec water power to Massachusetts without incurring excessive losses, and with sufficient reliability and stability.

The total available continuous power of the rivers of Quebec other than the St. Lawrence is about 5,000,000 h.p., of which about 700,000 is now developed, and about 600,000 is under construction. About 600,000 h.p. of continuous power of this undeveloped power lies within a radius of 300 miles from eastern Massachusetts.

Not only does the rubber trade of New England look forward to the consummation of these projects as sources of additional and economical motive power for future expansion, but the insulated wire branch of the trade sees in it a source of much profitable business. In 1919 the rubber industry of the United States consumed 429,889 primary horsepower.

Massachusetts Notes

The J. Frank Dunbar Co., Inc., crude rubber brokers, New York, N. Y., is now represented in Boston by H. A. Libby, at 92 State street.

The New England Rubber Co., heel manufacturers, formerly at 9 Gannett street, are now located at 150 Lenox street in the South End of Boston.

Announcement is made that the World's Rubber and Tropical Exposition will be held in Boston during the week of October 10 to 17, 1925, probably in the Mechanics Building. It will be under the personal supervision of Chester I. Campbell, the successful promoter of industrial shows. Plans are maturing rapidly to make it not only a comprehensive exposition of rubber products and rubber goods manufacturing but of the production and preparation of rubber as well, both plantation and wild.

The stage is being rapidly set for the fifth annual National Shoe Style Show and Leather Exposition to be held in Mechanics Building from July 14 to 17 inclusive, immediately following the great National Elks' Convention week. The evening Style Revue, when the latest creations of the footwear designers and manufacturers will be displayed by living models, again promises to be an outstanding feature. Scores of firms in the leather and rubber footwear and kindred trades will keep "open house" to their customers and friends during the week and some of them will have elaborate programs of varied entertainment.

"My Test of Good Management" is the title of an illuminating article in the May issue of "System" by Marquis M. Converse, president of the Converse Rubber Shoe Co., Malden. In it he tells how a $6,000,000 annual business has been built up by doing things differently in respect to products, methods, sales and advertising policy.

An important addition to the rapidly increasing number of motor bus lines in this state is forecast by the application of the Eastern Massachusetts Street Railway to the State Department of Public Utilities for a permit to operate the first long distance motor bus line in the state, between Boston and Lowell, a distance of approximately thirty miles at a fare of one dollar. The tendency hereabouts to replace trolley lines with motor bus service promises within a few years to develop a considerable outlet for pneumatic tires of large size.

The annual summer shutdown of the plants of the Boston Rubber Shoe Co., Malden, and the American Rubber Co., Cambridge, both subsidiaries of the United States Rubber Co., is announced to be of five weeks duration beginning June 27.

H. C. Young, Jr., formerly sales service manager at the United States Rubber Company's branch at Rochester, New York, has been transferred to a similar position at the Boston, Massachusetts, branch.

The Rubber Trade in Ohio

Manufactured Goods

The past month as well as the first six months of the year have been marked with fairly satisfactory conditions in the Ohio rubber industry which centers in the Akron district. A new survey shows that more than half of the business being done is at a satisfactory profit, while the remainder is on a profitable basis with practically no deficit. During this period tire output has reached a high point, with gradual declines registered during the past few weeks leading to a production figure of less than 80,000 tires a day for the Akron district at the present time. The curtailment is due to the reduced demand of automobile manufacturing companies for original equipment tires, while the continued backward season has led to further piling up of inventory of finished goods in the hands of the makers and dealers throughout the country.

What the second half of the year will bring forth is a matter of speculation. This period of last year was marked by a sharp cut in tires which made impossible profitable production except by the most efficient organizations. As the middle of the year approaches, the cutting policy has again been started through reductions in the price of balloon tires, which have produced good profits thus far. If price reductions are continued into the full tire line it is certain that last year's experience will be duplicated and little profit shown during the remainder of the year.

In other lines Akron manufacturers seem more fortunate than those located elsewhere. Footwear departments, which are reported very quiet in other cities, are reported in Akron to be producing at least 50 per cent as many pairs daily as during the peak period. Specialties to a large extent are responsible for this

good showing. Footwear departments will be closed down only two weeks for inventory.

Mechanical goods sales continue satisfactory in spite of the reduction in industrial activity throughout the country. These departments continue to operate at better than 50 per cent of normal.

Radio popularity has made for a continued demand for hard rubber goods, while the demand for surgical goods has continued slightly better than normal at this season of the year. Labor conditions have remained very satisfactory with a supply of men larger than the industry could absorb. This is attributed to the fact that more than 5,000 have been laid off by the industry while inclement weather gave them little opportunity of engaging in outdoor work.

Curtailment of cost of production and distribution continues to be the uppermost problem with industrial leaders. Low overhead and distribution costs have given one large Akron manufacturer a decided advantage, with the result that this producer is setting a pace hard to follow by those with higher overhead.

Mason Reorganizes Executive Personnel

Important changes have been made in the executive personnel of The Mason Tire & Rubber Co., Kent, Ohio. O. M. Mason, president and a director of the organization, has resigned, following the decision of his brother, D. M. Mason, to no longer continue as treasurer and a director, due to ill health. In their places are: W. A. Cluff, who succeeds O. M. Mason as president of the company and D. M. Mason as treasurer, while H. P. Shupe and T. G. Graham have been elected directors to fill the unexpired terms of the two brothers. Mr. Cluff has for a number of years been secretary of the Mason organization, while for the last three years Mr. Graham has been factory manager. J. H. Diehl will continue as vice-president and sales manager.

President Cluff has stated that a new economy program will be introduced in an effort to turn the deficit of $535,000 of 1923 into a profit during the present year. Business during the first four months of the year amounted to $3,500,000, or on an annual basis of $10,500,000 a year, while in November of 1923 business dropped to approximately $300,000. Profits for April on $958,000 business after all charges, including depreciation, amounted to $43,000, more than the preferred dividend requirements.

Balloon Tire Sales Policy

The price of balloon tires dropped during the middle of last month when the major companies inaugurated a policy of giving free with every complete change of tires from high to low pressures a complete set of four wheels and five rims. The movement was started by Firestone, and within a few days the new policy was followed by Miller, Goodyear, Lee and General Tire & Rubber Co. The new policy is equivalent to a 15 per cent cut in price.

This policy is undoubtedly an effort to stimulate the balloon tire business. Meetings which have been held lately by tire makers with automobile manufacturers indicate that balloon tire sizes may be reduced to less than one half of the present number. The entire summer will be required, manufacturers state, to work out details of the plan.

Tire Prices Cut

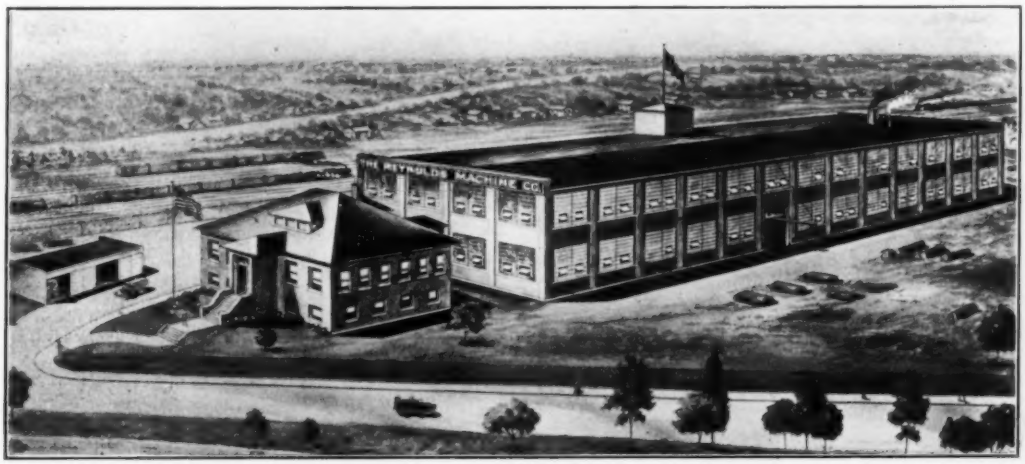
The entire rubber industry here either has joined or will join in the downward price revision which was inaugurated by the Fisk Rubber Co. shortly after the middle of the month. For the most part the larger companies at this writing have already informed their dealers of the new prices, and those who have not already done so will do so before the end of the month.

The drop in the price lists amounts to from slightly over two per cent to a maximum of 20 per cent with a general average said to be somewhere in the neighborhood of 15 per cent.

As pointed out previously in these columns, the cut will not affect the rubber industry as seriously as did a similar price cut during the middle of the past year. The fact that costs have been materially reduced and raw material prices are lower, while excise taxes are cut in two will make possible continued profits despite the reduction.

The Reynolds Machine Co.

Since the establishment in 1917 of The Reynolds Machine Co., Massillon, Ohio, the organization has grown steadily, and plant additions at various times have been necessary. The company specializes in tire molds and cores, particular attention being given to the quality and accuracy of its "Remaco" equipment.



Plant of The Reynolds Machine Co., Massillon, Ohio

The factory, which contains the most modern types of machinery, is well located, having connections with three lines of railway. Sales of the company's products during 1923 represented an increase of more than 40 per cent over 1922, while the 1922 business was more than 100 per cent greater than that of 1921.

Executives of the Reynolds organization include: F. C. Snyder, president; E. H. Birney, vice-president, and O. F. Binford, secretary, treasurer and general manager.

Ohio Rubber Company Reports

For the most part the reports from tire and rubber companies in Ohio outside of the Akron district have been encouraging.

The Standard Tire Co., Willoughby, is reported showing a fair profit on a production ticket of 650 tires a day. The company produces some balloon tires. The Victor Rubber Co., Springfield, is on a ticket of 800 tires a day. The Mansfield Tire & Rubber Co., Mansfield, is reported to be producing 2,000 tires a day. The National Tire & Rubber Co., East Palestine, has a schedule of 1,000 tires a day and is showing a very good profit. The New Tread Tire & Rubber Co., East Palestine, is producing 400 tires a day at a satisfactory profit.

At Canton the Triangle Tire & Rubber Co., which took over the Gordon Tire & Rubber Co., is said to be operating with a schedule of 400 tires a day. The company is under the management of R. W. Kent, formerly with the Republic Rubber Co. The Cooper Rubber Corporation, Findlay, is reported to be making 800 tires a day, while production of the Giant Tire & Rubber Co. of the same city is said to be 900 tires a day.

At Salem the Salem Tire & Rubber Co. is producing 300 tires a day with satisfactory profits. The Denman-Myers Cord Tire Co. is said to be making in the neighborhood of 300 cord tires a day.

Akron Notes

The report of The General Tire & Rubber Co., Akron, Ohio, covering the first six months of the year is expected to show earnings comparable to any similar period in the company's history. The policy of not taking on any new dealers will be continued a few months longer or at least until the present demand is satisfied.

Akron equipment makers have enjoyed the best half-year since 1920, due to the demand for balloon tire equipment. It is estimated that this business amounted to more than $1,000,000 during the first half of the year. The fact that the new equipment was needed faster than it could be produced made it possible for equipment makers to obtain better than average prices for their product. The demand for this type of equipment, however, is slowing down at the present time.

A specially built car, mounted on Firestone balloon tires, and equipped with every camping comfort, even to a costly radio outfit, has been prepared for W. C. Stevens, manager of the machine design department, at the plant of The Firestone Tire & Rubber Co., Akron, Ohio. Traveling in this car, Mr. Stevens and his wife will take a six months' trip through the Far West, incidentally enjoying a little hunting in the mountains of Colorado.

W. C. STEVENS, FIRESTONE MECHANICAL EXPERT STARTS ON WESTERN TOUR IN SPECIAL CAMPING CAR WITH GODSPEED BY HARVEY S. FIRESTONE.

The Trump Rubber Co., East Akron, Ohio, has installed additional power equipment which will make possible the addition of equipment to increase output. The company specializes in molded goods, and also makes a few balloon tires.

Executives of the Seiberling Rubber Co., Akron, Ohio, state that the company's sales in April were exceeded in May, while in all probability the June business will be larger than that of May. F. A. Seiberling is president.

Production is increasing at the newly established plant of The Durable Balloon Tire Co., Akron, Ohio, an organization specializing in the manufacture of a 31 by 4.40 clincher balloon casing. G. W. Pancoast is vice-president.

The American Rubber & Tire Co., Akron, Ohio, is now producing between 400 and 500 tires a day, representing about 80 per cent of plant capacity. Sales during April were equal to those of February and March combined, while the May business, although not so good as that of the month preceding, was very satisfactory. F. C. Snyder is president.

W. C. Cassidy and O. C. Moles, formerly with the Goodyear Tire & Rubber Co., together with W. L. Wilkie and N. O. Mather, attorneys, have formed the American Rubber Export Co., with a capitalization of $10,000. The company's office will be located in Akron.

M. A. Flynn has resigned as superintendent of the labor department of The B. F. Goodrich Co. Mr. Flynn has been with the Goodrich company since the consolidation with the Diamond Rubber Co.

India Tire & Rubber Co., Akron, Ohio, reports through its president, J. M. Alderfer, that operations during the past quarter have been better than any previous period in the company's history. The company has declared an extra dividend of 50 cents a share on the common stock, payable July 1, in addition to the regular dividend of $1 a share on the preferred. This showing is due to a large extent to the policy of selecting high class dealers and doing no original equipment business.

Ohio Notes

The Houk Rubber Co., organized several months ago by Henry L. Houk, formerly general manager of the American Rubber & Tire Co., has purchased the plant and equipment of the former Tuscora Rubber Co., Dover, Ohio, and will start production of mechanical goods, druggists' sundries, and possibly tires in the near future.

Receivership of the Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, has been extended until the end of July, according to R. W. Jenks, receiver. Plant operations have been reduced to less than 100 tires and several thousand belts a day. The future of the company will be decided at a meeting of the company, creditor and court officials at the end of July.

Plans for the reorganization of the Ideal Tire & Rubber Co., Cleveland, Ohio, under the direction of O. L. Brown, industrial engineer, are said to be practically completed. The following directors have been elected: D. T. Holliker, G. Smith Kennedy, Fred Bigler, A. A. Parker, A. G. Cowder, F. C. Thornton, J. A. Parfitt, W. W. Wheeler, Herman Nass and John Schimmelman, all of whom are from Cleveland, together with S. T. Walker of New Philadelphia, C. A. Eckley of Dayton and William Harrison of Youngstown.

Operations in a leased building have been started on a small scale by the recently formed Fremont Rubber Products Co., Fremont, Ohio. The company is capitalized for $25,000. Officials are: M. Braily, Akron, president; D. B. Love, Fremont, vice-president; L. D. Weber, Fremont, secretary and treasurer. Principal products made by the company are auto mats, stair treads, and belting.

Edmond Shaw has been named factory manager and a director of the Northern Rubber Co., Barberton, Ohio. Mr. Shaw until

several months ago was connected with the Firestone company. The Northern Rubber Co. purchased the former Biltwell Rubber Co. plant in Barberton about a year ago.

The Pharis Tire & Rubber Co., Newark, Ohio, employs 400 men; approximately 1,500 tires and 1,000 tubes a day are being manufactured. The output includes 500 balloon type tires to fit 30 by 3½-inch rims. Executives are: A. R. Lindorf, president; C. H. Otto Meyer, vice-president; Charles O. C. Lindrooth, secretary; R. S. Wyeth, treasurer; and Carl Pharis, general manager.

The Erie Rubber Corporation, Sandusky, Ohio, makes balloon tires and a smaller cord casing to be called "Sandusky," in addition to the company's regular line of "Erie" cords. The factory is now on a two-shift schedule and has a large volume of orders. J. M. Dine is sales manager.

The Cooper Corporation, Findlay, Ohio, is running at capacity, with indications of good business throughout the summer. The company has complete equipment for making all sizes of balloon tires to fit present rims as well as those for 20- and 21-inch wheels. J. F. Schaefer is vice-president in charge of the tire manufacturing division.

Following the installation of new equipment at the plant of The Rufenacht Rubber Co., Bucyrus, Ohio, the daily output will be approximately 350 cord tires, in all sizes. The manufacture of 30 by 3½-inch fabric tires will also be continued.

H. L. Wilson has been appointed by the Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, branch manager at Cleveland, Ohio. He will look after the territory in that section.

The Rubber Trade in the Midwest

U. S. Rubber Merges Chicago Interests

Since 1909 there have been at intervals consolidations at Chicago, Illinois, of the various sectional interests of the United States Rubber Co., whose main offices are at 1790 Broadway, New York, N. Y. The final and largest merger to date occurred on May 1, 1924, when the United States Tire Co., with its four sub-branches at Davenport, Iowa; Peoria, Illinois; South Bend, Indiana; and Cedar Rapids, Iowa, combined its offices with those of the Chicago branch of the United States Rubber Co., which in turn has been made up of seven organizations, representing mergings at various periods. This enlarged Chicago branch has a territory of some 90,000 square miles, and serves over 8,000,000 people.

At Detroit, Michigan, the United States Tire Co. of that city and the general branch of the United States Rubber Co. brought their sales organizations under one roof at 6670 East Jefferson avenue, in one of the buildings that front the company's Morgan & Wright factory.

The Bristol Co. Opens Chicago Service Station

The Bristol Co., Waterbury, Connecticut, manufacturer since 1889 of recording instruments, has leased over 2,000 square feet in the Larkin Building, 3617 South Ashland avenue, Chicago, Illinois, the newly acquired space to be devoted to repairing and recalibrating the company's instruments.

Executives of the Bristol organization include: William H. Bristol, president; Howard H. Bristol, vice-president; Samuel R. Bristol, secretary; Harris Whittemore, treasurer; H. L. Griggs, general sales manager; and J. B. Kelsey, assistant sales manager.

Midwest Notes

W. C. Martin & Co., 4417 Wentworth avenue, Chicago, Illinois, manufactures an air-cell tire, said to be particularly adapted to the lighter styles of trucks. This special casing is applied to the regular pneumatic rim and is guaranteed for one year of service, the mileage being, however, considerably in excess of 25,000 miles.

The Motor Tire Sales Corporation, 1514 South Michigan avenue, Chicago, Illinois, has increased its capital stock from $5,000 to $50,000.

The plant of the International Rubber Company of America, Anderson, Indiana, is now operating at about 50 per cent of capacity, and the outlook for the coming months is encouraging. In addition to tires, the company is now manufacturing "Long Wear" tubes. J. D. Wiggins is general manager.

The Andrew Trieb Tire Co., Inc., 541 North Capitol avenue, Indianapolis, Indiana, is maintaining an unusually well equipped service station, and is handling a full line of Dunlop tires. Andrew Trieb is president of the organization.

A. E. Lewis, formerly western district manager for the Ajax Rubber Co., is now the general sales manager of the Johnstone Tire & Rubber Co., Laporte, Indiana.

May sales by the Corduroy Tire Co., Grand Rapids, Michigan, were approximately double those for May, 1923, while prospects for the future are said to be excellent. The tire and tube departments are working during the month of June on an increased production schedule.

The Wright Rubber Products Co., manufacturer at Racine, Wisconsin, of Wright rubber tiles and flooring, announces the election of the following officers: Clarence Wright, president; L. J. D. Healy, vice-president; and Harold oKelbel, secretary and treasurer.

The Marathon Rubber Products, Inc., Wausau, Wisconsin, is now in full operation, making rubber surfaced clothing, although other rubber goods are also being produced. On April 1 the corporation took over the factory property formerly owned by Marathon Rubber Products, the plant having been purchased from the receivers. A. Burnett is secretary and general manager of the new organization.

Repairs will be made at once at the plant of the Gillette Rubber Co., Eau Claire, Wisconsin, where a fire recently occurred in the bicycle tire department. Production was not interfered with, the damaged building being separate from the rest of the plant.

At the annual meeting of the stockholders of the Racine Horseshoe Tire Co., Racine, Wisconsin, all the officers were reelected. The only change in the directorate was the appointment of William T. White as successor to S. Harold Greene.

L. G. Peterson is now in charge of the tire department as maintained by the John D. McTavish Co., First and Thirty-first streets, Billings, Montana, a company dealing in tires, tubes and accessories.

Charles W. Hacker, who has been manager of the truck tire department at the United States Rubber Company's branch at Indianapolis, Indiana, has been given a territory covering the districts of Indianapolis, Minneapolis, Chicago, Omaha, and Des Moines.

The agent in Omaha, Nebraska, for The General Tire & Rubber Co., Akron, Ohio, is the Adair Rubber Co., which maintains offices at 2030 Farnam street. C. F. Adair is president and F. J. Burbeck secretary of this dealer organization.

O. E. Hoerger, formerly in the Akron offices of the Firestone Tire & Rubber Co., Akron, Ohio, is now branch manager at Denver, Colorado.

The Servus Rubber Co., Rock Island, Illinois, is soon to build an addition to its plant which will result in an increase of output to 7,500 pairs of rubber footwear daily. The company has also increased its capitalization from $1,000,000 to $1,500,000, and is issuing 5,000 shares of 7 per cent cumulative preferred stock of the par value of $100 a share.

The Wildman Rubber Co., Bay City, Michigan, is making additions to its plant, where production will again begin about October 1, 1924. W. W. Wildman is president.

The Rubber Trade on the Pacific Coast

Manufactured Goods

A tendency to defer buying, in the expectation of lower prices, has been quite general on the Pacific Coast among jobbers and other large dealers in rubber goods. This hesitation has been more pronounced among buyers of mechanical goods than of tires, although purchasers of the latter still believe that prices may ease up before September. An excellent demand due to favorable seasonal conditions is rapidly reducing tire dealers' stocks. Balloon tires are being eagerly sought, and dealers find it difficult to obtain supplies from eastern and midwestern factories.

In the oil industry conditions are much better than a few months ago. There is a good demand for rubber belting for drilling outfits in new fields, and in old fields where a steadily increasing number of gushers are being "put on the pump." There is sharp rivalry in selling. A general complaint among purveyors of rubber goods for the mining, cement, rock and gravel and various allied building trades is that although they are selling more goods than a year ago, profits are 5 to 10 per cent less. This reflects the general trend in building material costs, which have fallen 10 to 20 per cent in the past few weeks; and further price recessions are expected soon.

Branches of eastern rubber shoe manufacturing concerns report a more encouraging state of trade, and many orders are reported for early 1925 delivery. Early rains, it is predicted, will mean a little famine in rubber footwear on the Coast, as buyers, taking their cue from the past unusually dry winter, failed to make adequate provision for a possible wet season this fall and winter. While retail trade in druggists' sundries has slackened, many of the distributers have of late been placing good-sized orders with eastern and midwestern factories for early winter delivery. Automobile rubber accessories, embracing a wide variety of articles, are being made to a greater extent than ever by coast factories and at prices competing keenly with transcontinental goods.

The Rubber Club of San Francisco

The Rubber Club of San Francisco, in which were enrolled the leading executives of manufacturing concerns and the branch managers of numerous eastern and midwestern rubber companies, and which did much good work at the outset of its career, has of late been quiescent. The members have been so busy attending to their own particular troubles that they have not found time to devote toward solving their collective anxieties, and incidentally promoting trade welfare in general. According to Secretary and Treasurer C. W. Jackson, however, the officers and other leading spirits of the club plan to get together shortly and revive association matters.

Portland Tire Dealers' Association

The Portland (Oregon) Tire Dealers' Association is one of the most active rubber trade organizations on the Coast. It has long been engaged in trying not only to put the tire business on a more profitable basis, but also to bring about various needed reforms. According to Secretary and Treasurer Marion F. Butler, the association plans for the fall and winter to correct, if possible, several trade abuses that tire dealers elsewhere have tried vainly to cope with and the officers feel confident of much success. The Portland association, which is affiliated with the National Tire Dealers' Association, has these officers (besides Mr. Butler): President, Earl Edwards; vice-president, Seth Leavens; directors, Messrs. Fletcher, McPhee, Cummings and Byron.

Pacific Coast Notes

Because of increasing business, the L. H. Butcher Co., Inc., has been compelled to move the San Francisco offices and warehouse to larger quarters at 274 Brannan street, where there are improved facilities for receiving and delivering merchandise.

The Mohawk Tire Co., 2863 Broadway, Oakland, California, is now distributer of Mohawk tires throughout Alameda County. The company reports its business as showing a steady upward trend. C. L. Smith is sales manager.

F. C. Flickinger, San Francisco branch manager of the Firestone Tire & Rubber Co., Akron, Ohio, reports sales as very much above the corresponding period last year. Deliveries of balloon tires, he says, are excellent, but demand keeps well in advance of supply.

Tire vulcanizing equipment and materials are selling in the San Francisco-Oakland district much better than for many months past. Repair work is confined to medium cost casings.

The General Electric Co., which recently bought five acres of land at 52d street and Santa Fé avenue, Los Angeles, will shortly erect the first unit of a series of buildings which will finally form a coast branch of the parent plant at Schenectady, N. Y. The first structure will be largely for repair work and will be a convenience for rubber manufacturers, who use much G. E. machinery.

W. C. Hendrie & Co., Los Angeles, mechanical goods distributer of the Republic Rubber Co., Youngstown, Ohio, will shortly begin the erection on E. Fourth street, between Crocker and Towne, of a 3-story and basement modernly equipped factory for the production of transmission belting, chiefly of leather. Mr. Hendrie, the senior member of the concern, came from Denver in 1912 and soon afterward founded the Hendrie Rubber Tire Co., Torrance, disposing of his interests a couple of years ago to Thomas H. Thropp, Trenton, New Jersey. He is also vice-president of the Asbestos Manufacturing Co.

The Miller Rubber Co. has removed from 21 Van Ness avenue to 240 Howard street, San Francisco. Here the company will also house its druggists' sundries branch, hitherto conducted separately. Leroy Wagner will continue to manage the latter, and the tire business will remain under the control of C. W. Jackson, who has been the Miller branch manager for several years.

The California Goodyear Tire & Rubber Co. announces a full quarterly dividend on the preferred stock scheduled for payment on July 1. The mid-month production ticket was 4,100 casings and 5,000 tubes, daily. Much of the progress is attributed to the recently organized selling organization, composed of the old company executives and known as the Goodyear Tire & Rubber Co., Inc. President E. G. Wilmer is also president of the new concern, A. F. Osterloh is vice-president; Walter I. Lyon, secretary; M. S. Kelly, treasurer; and they, with General Superintendent H. E. Blythe, form a directorate of five.

J. C. Lawrence, president of the Racine Horseshoe Tire Co., Racine, Wisconsin, formerly director of finance of Goodyear Tire & Rubber Co., Akron, Ohio, has been making a personal study of trade conditions on the Coast, and reports the tire outlook very encouraging.

Elmer S. Firestone, Los Angeles branch manager of the Firestone Tire & Rubber Co., Akron, Ohio, and brother of Harvey Firestone, president and general manager of the company, "chaperoned" a party of sixteen members of the southwest sales organization, who made the trip by special car to the annual conclave of sales managers at the Akron, Ohio, plant. Mr. Firestone brought back the news that the 50 per cent balloon tire production of the Firestone company will be increased within less than a year to a ratio of 75-25 with the balloons on the long end of the scale.

According to E. F. Norton, general manager, the Spreckels "Savage" Tire Co., San Diego, is being completely overhauled in order to enhance its efficiency. The output now averages 100 casings a day. Recently the company bought considerable mold equipment, a fourth calender, and has now three more 60-inch mills on the way. New heaters are also being installed, and the factory is running three shifts of workers every 24 hours. When

the new machinery is all placed, the factory will have a capacity of 2,000 tires daily. Business is reported excellent, sales being far in excess of a year ago and much ahead of the average output.

The Willard Rubber Products Co., Inc., 1340 Kettner Boulevard, San Diego, California, has been capitalized at $100,000, to develop a process for devulcanizing rubber. It is claimed that this special product can be used for dipped and spread goods as well as for every purpose for which crude rubber can be used. Cyrus Field Willard heads the new organization.

TIRE PRICES CUT

The Firestone Tire & Rubber Co.'s announcement of last month, that a set of wheels would be given to dealers ordering balloon tire equipment, was followed with similar offers by the United States, Goodyear, Goodrich, and Lee companies. This is virtually a 15 per cent cut on balloon tires. Later The Fisk Rubber Co., announced a cut of about 15 per cent on balloon, cord, and fabric tires, which, it is understood, will be met by the other large producers, although public announcement has not yet been made.

The Rubber Trade in Canada

Manufactured Goods

THE backward season has retarded somewhat the volume of retail sales of rubber footwear, such as tennis, yachting and other lines, but with the fine weather of the last few days this decrease will be replaced by a gain. Tires are being well displayed and particularly well advertised, and dealers are looking forward to even better volume since it has been estimated from reliable statistics that the number of motor vehicles in the city of Montreal this year is 80 per cent greater than last year. A large quantity of rubber belts have been marketed by several of the Canadian rubber goods concerns, who are finding a steady growing trade for these goods. This is the season when soft and hard rubber balls as well as toy balloons are in active demand. Rubber transmission and conveyor belting is lower in price and according to reliable information is equivalent to a cut of from 7 to 10 per cent according to the goods offered. The camping season now at hand has increased materially the call for rubber sheeting, and auto top makers have their hands full completing orders on hand.

It is expected that a record will be set this year in building construction. Reports from various sections of the country indicate a large volume of work under active development and consideration. It is probable that considerable demand for insulated wire will come into the market during the latter part of the summer. Druggists' sundries and hard rubber goods are in fair production, taking into consideration the season of the year. A great stimulation in sales has been noted in garden hose in the various sizes and qualities. The dry weather that has existed is mainly responsible for this movement. Distributers expect this brisk activity to continue well into July.

Goodrich Making Complete Tire Line

The B. F. Goodrich Rubber Co. is now manufacturing a complete line of tires in Canada and exploiting through newspaper publicity the Silvertown cord tire. The company is at present confining sales efforts in Canada strictly to tires; however, it would not be surprising at some future date to hear of plans for the manufacture of rubber footwear, such as high rubber boots and goods of that description.

Dunlop Trademark History

Hardware & Metal recently ran a Trade Mark number in which the following appeared with reference to the Dunlop Tire & Rubber Goods Co., Ltd., Toronto:

Originally the Dunlop "Two Hands" trademark carried the slogan, "These are the only tools you'll need," the reference being to quick detachability in bicycle tires. After becoming one of the widest-known trademarks in the country, the tire industry broadened to take in automobile, truck and motorcycle tires. The trademark had to broaden, not only because the tire business had developed new ramifications, but the Dunlop company had also embarked into the mechanical end of the business, namely, rubber belting, rubber packing, rubber hose, etc.

Obviously the "Two Hands" sign, with the original slogan, had no bearing whatever on the mechanical end of the business, so "These are the only tools you'll need" was changed to "Seal of Quality." Then the "Two Hands" and the phrase were brought into a scroll arrangement that immediately linked them up with the idea of Dunlop rubber goods, automobile tires, truck tires, or whatever might be the individual line receiving the publicity. "Dunlop" being a patented word in Canada and the "Two Hands" a patented trademark, gives the company double trademark strength.

Crêpe Soles Popular

A canvass among manufacturers featuring crêpe soles finds that these goods are going over big, and there is no doubt that the crêpe sole is one of the greatest improvements in rubber sole canvas footwear. The Dominion Rubber System recently ran impressive newspaper copy under the caption, "Crêpe Soles Worn by Tennis Champions," quoting the United States Lawn Tennis Association as having officially recommended the use of these soles.

Canadian Notes

"Bobby Leach," the only man who has gone over the Horse-Shoe Falls and lives to tell the tale, plans to make a duplicate trip this summer in a specially constructed rubber ball. Negotiations are in progress now with several rubber manufacturers who are interested in making the ball, which will be about as thick as an automobile tire, and on the inside there will be a hammock in which Leach will recline. Straps will be attached to the interior to be grasped by Leach in making the tumble over the falls.

The Dunlop Tire & Rubber Goods Co., Ltd., Toronton, has received an invitation from the Dunlop Rubber Company of Fort Dunlop, Birmingham, England, and extended to anyone interested, who might be visiting the British Empire Exhibition at Wembley, at any time during the period of the exposition to enjoy their hospitality during their stay.

A recent local daily newspaper contained no less than nine advertisements of tire manufacturers, all of them with one exception advertising balloon tires. Inquiry among leading tire retailers elicits the information that it will be some time before balloon tires become regular equipment, as at present the extra cost of fitting is detrimental to their sale and popularity, although a number of the Canadian automobile manufacturers are offering them as standard or optional equipment.

THE BENNETT ELASTIC WEB CO., CHICAGO, ILLINOIS, IS MARKETING in large quantities an elastic headband especially for women tennis players, and elastic knee pads for athletes. This firm reports that last year more than 70,000 of its elastic bands were sold.

Canadian Rubber Industry Census for 1922

By Consul G. R. Taggart, London, Ontario, Canada

According to the latest report of the Dominion Bureau of Statistics, there were in Canada in the calendar year 1922, 34 plants manufacturing rubber products: 10 plants manufacturing rubber footwear, 4 of which were in Ontario and 6 in Quebec; and 24 plants manufacturing other rubber products, 20 located in Ontario, 3 in Quebec, and 1 in British Columbia.

The number of rubber footwear factories decreased from 12 in 1921 to 10 in 1922, with a corresponding diminution in the capital investment from $15,816,832 in 1921 to $14,474,698 in 1922. This portion of the industry gave employment to 4,645 persons during 1922, paid salaries and wages amounting to $3,788,565, used materials costing $4,928,825, and produced a total of $14,709,830 worth of goods, which, notwithstanding the decrease in the number of plants, shows an increase in production over the total of $13,851,744 in 1921, when employes numbered 5,065, salaries and wages amounted to $3,947,869 and cost of materials to $4,637,137.

The 24 factories manufacturing other types of rubber goods represented a capital investment of $35,679,805 in 1922, a decrease of nearly $3,000,000 from the capital investment of 1921, which is explained by diminished inventories of materials, stocks in hand and working capital; however, the total value of production of these factories during 1922 was $31,223,238, as compared with $25,618,042 in 1921. Over 50 per cent of the Canadian rubber industry is said to be American owned or controlled. In this branch of the industry 5,497 persons were employed, salaries and wages amounted to $6,538,343, and materials used were valued at $14,268,120.

Tire Production and Value

The value of tires, $19,519,208, and tubes, $2,618,584 produced in 1922 represented approximately 48 per cent of the total value of rubber goods produced, and is a value increase of nearly $4,000,000 in casings and $337,000 in tubes over the 1921 production. Numerically the production of casings, 1,482,796 and tubes, 1,504,837 was an increase of over 625,000 casings and 521,000 tubes over 1921. Approximately 66 per cent of the tire and tube production was of sizes ranging between the 30 by 3½ and 32 by 3½ sizes, and 20 per cent between the 31 by 4 and 34 by 4 sizes. The average unit selling value of casings in 1922 was $12.97, as compared with a unit value of $12.52 for casings exported from the United States in 1922 and $11.22 in 1923.

The total production of solid tires amounted to 15,572 tires valued at $476,735. The motorcycle and bicycle tire trade is relatively unimportant, 22,682 motorcycle tires valued at $151,470; 15,887 tubes valued at $15,023; 171,441 bicycle tires valued at $220,051 and 182,861 bicycle tubes valued at $115,008 having been produced during 1922.

Footwear Production and Value

The following table shows the quantity and value of the rubber footwear production of Canada during the year 1922:

	Quantity, Pairs	Selling Value at Factory
Rubbers	5,863,172	$4,471,602
Rubber boots	465,582	1,662,807
Gum rubbers	1,080,335	2,799,389
Overshoes	576,771	1,273,972
Canvas shoes with rubber soles	4,091,167	4,378,821
Rubber and composition soles and heels	9,586,269	923,377

The average unit value of rubbers was $0.76, rubber boots $3.57 and canvas rubber-soled shoes $1.16. The values of other manufactures of rubber were: rubber matting $232,429; packing $86,870; battery jars $105,308; belting $1,625,791; hose $1,513,582; and druggists' rubber sundries $488,134.

Imports of Rubber and Rubber Goods

During the calendar year 1923, the total value of rubber and rubber goods (other than rubber footwear) imported into Canada amounted to $13,026,188, compared with $7,238,279 in 1922, an increase of $5,635,959, which is chiefly due to the increase in 1923 in the value and quantity of crude rubber imported. Imports of casings and tubes decreased in value from—casings $1,040,244, tubes $125,215 in 1922 to casings $943,271 and tubes $80,368 in 1923. Crude rubber imports amounted to 29,695,626 pounds, valued at $8,528,945 in 1923 and 21,075,630 pounds, valued at $3,495,049 in 1922.

Imports of rubber boots and shoes during 1923 amounted to 116,986 pairs valued at $180,184, as compared with $95,507 in 1922. The largest percentage of these imports came from the United States; the United Kingdom furnished most of the remainder, with small amounts coming from Japan. The unit value of the imports from the United States was considerably higher than for those from the United Kingdom.

Rubber Goods Exports

The total exports from Canada of rubber goods (other than footwear) was $7,358,845, which shows a considerable increase over the $5,105,161 worth exported in 1922. Pneumatic casings and tubes accounted for 84.4 per cent of the total 1923 exports and 84.8 per cent in 1922; the value of exports in 1923 being $6,087,281 as contrasted with $4,330,556 in 1922. The 1923 exports of casings amounted to $5,605,644, an increase of over 78 per cent over the $3,132,130 exported in 1922. Exports of tubes decreased from $1,198,426 in 1922 to $605,969 in 1923. The excess of Canadian exports of casings over imports was $4,569,125 in 1923, and the excess of imports of tubes $515,089.

The total exports of Canadian rubber boots and shoes in 1923 consisted of 455,686 pairs valued at $602,855, compared with a value of $436,564 in 1922. The unit value of these imports during 1923 was $1.30. Exports of canvas shoes with rubber soles amounted to 1,669,062 pairs valued at $1,171,486, a unit value of $0.70, compared with a value of $772,645 in 1922. The United Kingdom, Australia, New Zealand, and Argentina are the principal markets for Canadian canvas rubber-soled shoes. The steady growth of Canadian exports of rubber belting, noticeable during recent years, is continuing. During 1922 rubber belting exports amounted to 320,642 pounds valued at $152,105; and to 450,062 pounds valued at $249,699 in 1923.

RAPID INCREASE IN EXPORTS OF MECHANICAL GOODS

Since the beginning of the year American exports of mechanical rubber goods have shown a steady increase, while the April shipments of these goods established a new high record for volume, with rubber hose at 446,767 pounds, and rubber packing at 195,909 pounds. The amount of rubber belting exported in April, 342,331 pounds, has been exceeded in only one previous month (May, 1923) when shipments totaled 385,175 pounds. The value per pound of belting exports, which averaged between 58 and 59 cents the first three months of this year, advanced to 62 cents in April. The tabulation following indicates the development in all three classes of goods.

AMERICAN EXPORTS, JANUARY-APRIL, 1924

	Belting	Hose	Packing
January	$148,139	$169,472	$69,435
February	151,601	140,092	47,146
March	181,005	155,053	76,004
April	212,174	166,097	83,561

The Sixth International Rubber Exhibition

Abstracts of Papers on Crude Rubber Problems[1]

Plantation Rubber—The Adjustment of Production and Consumption

By H. Eric Miller

PREFACING this paper, emphasis is laid on the fact that the complexity of modern industry makes the adjustment of production to meet the varying needs of consumption a matter of great difficulty and it is generally assumed that concerted measures taken to assist this adjustment are designed to secure unwarranted profits to the producer at the expense of the consumer.

For many reasons, such as the long time required to bring a plantation into bearing, the high cost of general upkeep, and the heavy expense of maintaining an efficient labor force, these difficulties of adjustment are more pronounced in the case of rubber than in the case of many other important commodities.

The writer then traces the growth of surplus rubber stocks, the fall of prices and the various schemes proposed to control production and prices.

Except for a short period in 1910, when, owing to a relative shortage in shipping, speculation carried the price up to a fantastic figure, there has been an increasing supply of rubber to satisfy an increasing demand at a constantly diminishing cost—the result of large scale production. Up to the middle of 1920 the production was always slightly greater than the absorption (except during 1918 when there was a considerable excess) but the excess was no greater than was necessary to provide the increase in working stocks. In 1918, owing to the requisitioning of shipping for military purposes, imports into all the principal consuming countries were drastically curtailed, which resulted in large quantities of rubber being accumulated in the eastern ports.

Exhibit of The Rubber Association of America at the Sixth International Rubber Exhibition

The writer then reviews the voluntary 80 per cent restriction of production in 1918 by about 75 per cent of the members of the Rubber Growers' Association of London to adjust output to meet an artificially reduced demand resulting from the war, and which kept about 35,000 tons of rubber off the market; also the voluntary 75 per cent restriction scheme of 1920, brought about by the increasing use of the cord tire, which was assented to by over 95 per cent of the members of the Rubber Growers' Association, some 70 per cent of the International Association at the Hague and a large proportion of the Ceylon and Malayan local producers.

The effect of the latter scheme, combined with the steadily falling price, was to reduce the output by over 25 per cent. Nevertheless surplus stocks increased 20,000 tons to 140,000 tons at the end of 1921. The following year each producer settled his own output policy; more rubber was again produced than the world could absorb and the price fell to 6¼*d.* per pound.

Various schemes to control output were considered without obtaining the necessary support, until the Stevenson scheme of compulsory restriction in Malaya and Ceylon, supported by voluntary cooperation of British estates in the Netherlands East Indies and elsewhere, was brought into operation on November 1, 1922, which is being adhered to by about 75 per cent of the plantation industry.

During the first fifteen months of its existence the average price of rubber was about 1*s.* 3*d.* per lb.—the pivotal price of the scheme, the world's free stocks were reduced by about 40,000 tons, no shortage of rubber has eventuated and the producing industry has been enabled to obtain a moderate profit.

The world's potential unrestricted productive capacity during the current year would be about 500,000 tons including wild rubber, hence if the Stevenson scheme were abolished and everyone were free to produce, over-production would again ensue, all confidence would be taken out of the market and the price would again fall to an unprofitable level.

Present and Future Problems of the Plantation Rubber Industry

By P. J. Burgess

Stating that problems and difficulties can be broadly divided into two classifications, physical and psychological, the author discusses the value and methods of manuring in the cultivation of rubber, the selection of plants, the study and control of diseases and pests, the need for precise knowledge as to the real function of latex in the life of the rubber tree, and the difficulties to be overcome in the transport and packing of rubber in order that the material shall be kept free from dirt and extraneous substances.

The writer feels that one of the biggest problems for solution is the reorganization of rubber growers in such a way as to avoid the present dissipation of strength by sub-division of rubber producing units and to put the industry into such condition that it can as a single unit, or as a very few units, deal with matters such as price, propaganda, and production on a comprehensive scale in the interest of all producers. He believes that had the recent control of rubber export been attained by voluntary means through direct and close association of the producers concerned, instead of by government action, the scheme would have been more speedy and effective and much of the opposition of the manufacturing and consuming interests would have been disarmed.

The work of the Propaganda Department of the Rubber Growers' Association is given as an instance of successful combination of interests and joint action despite peculiar difficulties. That raw rubber is consumed only as a constituent part of a manufactured commodity makes the relation between price and quantity slow and imperfect in action, and for this reason rubber cannot be expected to respond readily to efforts made for the stimulation of consumption.

[1]Read at the rubber conference during the Sixth International Rubber Exhibition, Brussels, Belgium, April 1 to 16.

The Production of Wild Rubber and Plantation Rubber in the French Colonies

By Aug. Chevalier

The paper sketches the transition in the last few years from wild rubber to plantation rubber as the source of supply for the world's needs. It is pointed out that in 1923 French industry absorbed 28,000 tons out of the total world production of 400,000 tons, and the belief is expressed that within a short time the Hevea plantations of Indo-China will be able to produce about one-fourth of that quantity.

The author states that the gathering of wild rubber in Equatorial Africa has not made for the progress of the country, and no attempt to organize this industry seems to hold out any promise of success.

An account of the Hevea plantations in South Indo-China is given in which it is computed that on December 31, 1923, these plantations, with those in the adjacent districts of Annam and Cambodia, covered 83,000 acres, in which area 4,437,000 trees were being tapped regularly, while the most modern methods of cultivation, selection of plants, tapping and latex coagulation customary in Malaya and Ceylon have been adopted.

The Rubber Industry—A Plea for Closer Working

By James Fairbairn

This is a plea for closer cooperation of producers of plantation rubber in restriction of production and the marketing of the commodity.

At present a compulsory restriction scheme is operating in British Malaya and Ceylon, while in South India, Burma and British Borneo the scheme is merely voluntary. This seems illogical; and the writer expresses the view that the Stevenson scheme should be made legislative throughout the British empire.

On the other hand he says that the policy of the Dutch planting interests is one of complete selfishness. Without consideration for their senior partners, the British, they have shown at the same time no regard for the good of the estates they control.

The position is that Ceylon and Malaya have compulsory restriction, other parts of the British Empire have a voluntary scheme, and the Dutch are producing all they possibly can, the result being that the price of rubber is still round about 1*s.* a pound.

More cohesion is also required in the method of selling the product. He suggests that each country responsible for large production should make a combination, which in its turn should work in an international organization. Allusion is made to the proposal put forward in the United States that Congress should permit the formation of agencies for the purchasing in common of raw materials at present alleged to be controlled by foreign monopolists. If such a combination comes into existence the writer believes the only possible course open to the producing industry will be to combine, and the European manufacturing industry will have to do the same in order to meet unfair competition.

ONAZOTE INNER TUBES

Onazote or expanded rubber, a special spongy product[1] shown at the Fifth International Rubber Exhibition in London in June, 1920, and utilized as a means for heat insulation, has recently been developed as a filling for inner tubes in conjunction with air pressure[2].

The object sought is to provide for pneumatic tires the combination of air inflated tube and a filling within the tube of gas or air impregnated vulcanized spongy rubber under pressure. A special advantage claimed is that the construction provides a convenient and interchanging form of the combination in a tube suitable for use in all makes of pneumatic tires of any given size. This feature is of particular service in pneumatic tires used for commercial vehicles because this form of tube is readily and easily transferable from a worn to a new tire whenever required without the aid of special tools or any expensive method of application. The construction combining air inflated tube and vulcanized spongy filling provides the necessary means to adequately control the pressure at all times within any pneumatic tire casing.

The spongy rubber filling employed is made in annular or endless circular form with exterior rubber skin which aids in retaining the gas pressure within. In this form the sponge can be used as an internal form upon which the air inflated tube can be built.

For inflation purposes an air valve is applied to the wall of the tube in the usual manner and connected by a flexible tube passing through the rubber filling to the inflated air space of the tube.

[1] THE INDIA RUBBER WORLD, August 1, 1921, 819 and 851; July 1, 1922, 709 and 722.
[2] United States Patent No. 1,488,998, C. L. Marshall.

Inventor of Many Rubber Articles and Processes

An American rubber man, inventor and promoter in England, is Morland Micholl Dessau. Born in 1855, the son of N. Dessau, for many years chairman of the Committee of Admissions of the New York Stock Exchange, he has been connected with the rubber trade of the United States and Great Britain since 1882.

M. M. Dessau

In 1893 he went to England, and two years later married Alice Emily Smith, grand-daughter of the late Reverend Sydney Smith, Canon of St. Paul's, London. Since that time he has resided there and promoted several different rubber trade ventures. He is an authority on crude rubber and rubber compounds, and has made two tours of the world in connection with the manufacture of rubber.

Among his numerous inventions of rubber articles, machinery and processes he is best known for the Dessau rubber capped wooden paving block. He was the first to lay a rubber roadway in a public metropolitan thoroughfare, which he did in London in 1913, and sold his interest in the patents to Rubber Roadways, Ltd., London, in 1915. He was the founder of the British Murac Syndicate, the owners of "Murac," for the improvement of low-grade rubber. He is also the inventor of Wapshare pneumatic tires, an expanding joint for guttering highways, a rubber skate, and machines for washing rubber and molding rubber biscuits.

Mr. Dessau is now governing director of the Rubber Estates Manufacturing Co., Ltd., 14 Mincing Lane, London, E. C., England. During the years 1921 and 1922, and up to July, 1923, he was engaged on development work in connection with the utilization of raw plantation rubber and its application for new and commercial purposes. He has had granted over 100 patents for articles for domestic, commercial and mechanical uses and utilities. Among his latest productions is a "double bouncer" playing ball which he asserts will bounce nearly 40 per cent higher than any other filled ball that he knows of.

MEETING OF CRUDE RUBBER TESTING COMMITTEE

The Crude Rubber Testing Committee of the Rubber Division of the American Chemical Society met on June 23 at Atlantic City, New Jersey. Consideration was given to several important problems. A report of this meeting will appear in our next issue.

The Rubber Trade in Europe

Great Britain

CONDITIONS in the crude rubber market, though quiet, show continued improvement, and more steadiness is evident. London stocks of 51,479 tons also compare favorably with 73,369 tons at the end of January last year. Unfortunately, while the statistical position has strengthened very materially, the price has fallen away, a somewhat paradoxical development. According to opinions quoted and discussed by *The Financial Times:*

"It seems that the market has lost the support afforded by the considerable speculative position that existed some 15 months ago. This acted as a buffer between producer and consumer by assisting materially to finance supplies pending their absorption by the manufacturer. Another factor is the state of affairs in the American tire trade. In more prosperous times the manufacturers carried substantial stocks of the raw commodity. Since 1920 bad times, severe price cutting and keen competition have tended to restrict the financial capacity of the big tire firms, which have in consequence developed the practice of running on minimum stocks and buying their raw material on the hand-to-mouth principle.

"There is a distinct risk of this latter policy being carried too far, having in view the regulation of supply according to price as per the restriction scheme. Should that prove to be the case, a smart recovery in the rubber market, accentuated by speculative buying, would be witnessed."

Rubber Restriction on Trial

According to the same publication the present time represents a critical period in the rubber industry, when the operation of the rubber export restriction enactment, now coming in for considerable criticism, is being watched with the closest interest. *The Financial Times* believes that the only redeeming feature of the restriction scheme is its constructive character, and further says:

"Since the market has fallen away, the objection to restriction in any form has given place to the plea that the regulations are not sufficiently drastic and flexible.

"While there is no doubt still room for improvement in some of the details of the enactment, the course of events goes to show that a large measure of success has attended its operation. That being so, very little sympathy will be extended to any proposed alteration of importance unless there is very weighty reason.

"While some alterations may be deemed advisable, it seems highly probable that no change will be even considered until after the current quarterly period ending July 31. Not until then will it be fully realized how very drastic are the regulations for dealing with the situation when the price averages less than 1*s.* for three months. Not only does a 5 per cent reduction then come into force, but the reduction will be cumulative until a substantial recovery is made. In other words, an additional 5 per cent reduction will take place every three months until an average of 1*s.* 3*d.* or over is reestablished."

Annual Meeting of Rubber Growers' Association

In view of the large interests involved there has been more than usual attention given to the proceedings of the Rubber Growers' Association, whose annual meeting occurred in London on April 29. On that occasion P. J. Burgess, presiding as chairman, referred to the work of the association in past years, its development from small beginnings, and its present satisfactory financial condition. He spoke at some length regarding the recent Rubber Exhibition, and its value from the point of view of propaganda for the consumption of rubber goods, a subject in which the association is particularly interested, and to which it has devoted much time and attention.

In considering the regulation of crude rubber exports Mr. Burgess stated that three facts stood out prominently and admitted of no discussion as to their reality, though there might be much as to their relative values: (1) That estates are able to produce at greater capacity than at present, and the knowledge of this fact has a depressing effect upon prices; (2) That first-hand sellers far outnumber actual buyers of rubber; (3) That production is continuous, while absorption is seasonal. Confronted now with the proposition emanating from official sources in the United States of a combination of rubber purchasers, the producing industry is forced to consider new measures if it would protect itself, and cooperation in the marketing of rubber appears to be the most promising solution of its problem.

"Half the difficulty," said Mr. Burgess, "has been overcome by bringing the production down to equalize the demand and clearing away the dead weight of surplus stock, and now that the statistical position is sound the other half of the difficulty is to take such steps as are necessary to insure a fair and reasonable price being paid for the material we have to sell. I do not wish to gloss over the difficulties which must attend any such effort to bring about a coordination of activity in one of the most important of the operations of estate and company administration—an operation which has hitherto been conducted on essentially individualistic lines. I am, however, convinced that the example of combination in the matter of exports enforced by legislation during the last 18 months has demonstrated the benefits that follow concerted action.

"If at the moment the position is not one of imminent disaster, as it was in the autumn of 1922, it is nevertheless one of difficulty and danger. Difficult because the present price of rubber returns too meager a profit on investment, and dangerous because it checks any prospect of development and thereby sows the seeds of future wild fluctuations of price, with no control on either side.

"But there is a way—uphill and difficult, perhaps, and not always clear to the varied visions of us all. The clue lies ready to our hands, spun of the spirit of goodwill and resolution to sink small differences and forego immediate personal advantage, looking rather for compensation in the general improvement which will follow better marketing methods."

The few remarks following by the vice-chairman, H. Eric Miller, were in confirmation of the statements of his predecessor, and concluded with the words: "The test in regard to combination or cooperation for selling will come when you have the details of the actual scheme before you, . . . but you can accept the assurance of your Council that whatever they may recommend will have been considered in the most careful possible manner, because it would be worse than folly to undertake a move of this kind unless the scheme were well founded in every respect."

H. E. Miller Elected Chairman of R. G. A.

H. Eric Miller, who was elected chairman of the Rubber Growers' Association at the annual meeting on April 29, has had a wide experience in the rubber industry, and has been especially associated with planting interests. Joining the firm of Harrisons & Crosfield in 1899, he became a partner on the incorporation of the concern as a Limited Company in 1908.

His first association with rubber growing occurred in 1903, when he became connected with the Pataling Co. Since that time he has been director of numerous and important plantation concerns. Mr. Miller has also for many years been an active supporter of the Rubber Growers' Association, joining its Council in 1910, and becoming an interested participant in the organization's work. He is a member of several important committees,

but has taken a particularly active part in the research work of the Association and also in the work handled by the Netherlands Indies Committee and the Statistical Committee. He is also one of the representatives of the Rubber Growers' Association on the Colonial Office Advisory Committee, and served in October, 1921, as one of the members of the Stevenson Committee, his knowledge of restriction schemes causing him to be especially appointed by the Government.

In January, 1923, Mr. Miller visited the United States as one of the three delegates sent by the Rubber Growers' Association in response to the invitation of the Rubber Association of America. His varied experience and a proved capacity for administration make the choice of Mr. Miller as head of an important organization a wise one, such executives being especially needed in a difficult period for the industry.

The Institution of the Rubber Industry

At the meeting on April 24 of the Birmingham Section of The Institution of the Rubber Industry there was an interesting exchange of views as to the parts played in the efficiency of the motor car by the work respectively of the automobile engineer and the tire maker. On this occasion the chief paper was read by H. S. Rowell, and dealt with the subject, "The Efficiency of the Pneumatic Tire as an Engineering Feature of Motor Car Design." Members of the Institute of Automobile Engineers had been invited, and in the discussion following their side of the case was represented. At the meeting on May 5 of the London branch of the Institution James Fairbairn read his paper originally presented at Brussels, Belgium, at the International Rubber Conference, his subject being: "The Rubber Industry—A Plea for Closer Working." Reference has been made to this paper in a previous issue and also in this number of THE INDIA RUBBER WORLD.

At the closing session for the season, held on May 26, the proposal to form a London Section came under favorable consideration. The work during the year of the Institution as a whole was reviewed, the statement being made that the membership now had reached 600, an increase of 126 members since the end of the last financial year. Papers for the 1924/25 sessions are now being arranged, and the coming meetings promise to continue as interesting and helpful as those in the past.

France

The Comité National de Chimie (National Committee of Chemistry) has been created by the Academy of Sciences for the double purpose of directing research work in the different branches of science and of giving directions in the matter of instruction in each particular branch.

The president of this committee is Professor Ch. Moureu and the president of the rubber section is M. R. Fric. The program for rubber research work includes a comparative study of the different methods of chemical analysis of rubber mixtures with a view to select an official method of analysis; aging tests; study of latex transportation and comparison of the value of different latices; study of organic accelerators and of the resistance of rubber compounds to various gases; study of the work on synthetic rubber done in Germany during the war.

Regarding instruction, the rubber section demands that lectures accompanied by films should be given in the various technical and industrial schools. For all this the cooperation of the rubber manufacturers has been requested.

Germany

At the Cologne fair there was an unexpected number of exhibitors, buyers and visitors, due to elimination of difficulties of obtaining permits to enter the occupied territory. Business in the rubber branch was satisfactory and might have been better were it not for the shortage of money, which limited the amount of credit that could be extended. The exhibits were chiefly of an industrial and technical nature. Export business was quiet owing to the fact that German goods now are too expensive.

Prices Going Up

The Price Convention of German surgical soft and hard rubber goods factories announced on April 24 that the gold mark prices on the list of March, 1924, would have to be raised as follows: seamless rubber goods, 25 per cent; patent rubber goods, mineralized and hard rubber goods, 20 per cent; for catheters, sounds, bougies, the gold mark prices of January, 1924, obtain, but the special discounts will not be given. The new prices became effective April 27, 1924.

Wholesale dealers may be allowed discounts up to 40 per cent; other dealers get the usual discounts; besides this, special rebates are allowed when orders are above a fixed minimum.

Continental Rubber Co.'s Report

The annual report of the Continental Caoutchouc und Gutta-Percha Compagnie, Hannover, indicates that despite abnormal conditions, 1923 was a satisfactory year. The plant operated to capacity the greater part of the year. Only during the last quarter was it necessary to discharge workers and to work on a part time schedule. In spite of this, sales at home and abroad increased. However, prices were somewhat lower, though raw materials were high.

The financial condition of the company is sound. The gross profits amounted to 353,356,926,952,024,064 marks and net profits 294,790,446,725,124,754 marks.

Holland

America's share in Dutch imports of rubber goods is unimportant except in tires, in which America takes second place. In 1923 the United States shipped 17,396 casings and 15,601 tubes. In that year France led, having supplied 40 per cent of the tire imports. There are about one million bicycles in Holland and bicycle tire imports are an important item. Last year Belgium furnished 36 per cent of bicycle casings. Most of the foreign motorcycle tires come from England, which together with Germany, also sends most of the solid and cushion tires. Germany further supplied 75 per cent of other rubber goods.

The Dutch rubber industry is being affected by foreign competition due to the advantage some countries, particularly France and Germany, have in their depreciated currency. It is said that of 29 factories in existence in 1914 only 15 now remain. Of these all, with a single exception, are in a bad condition.

Netherlands Rubber Dealers

On May 30, 1924, the Netherlands' Association of Rubber Dealers, Amsterdam, was founded. The aim of the society is to guard the interests of the members and to act on their behalf whenever joint action is desirable. The officers elected for the first time are Mr. G. A. Vaute, president; M. Onnes van Neijenrode, secretary; M. J. Onereijnder, treasurer.

Hungary

The two concerns at present manufacturing rubber goods are the Hungarian Rubber Goods' Factory and the Dr. Dorogi & Co. Rubber Factory. They are working at 50 per cent of maximum capacities and would not even be able to maintain this were it not for government import restrictions. These factories produce all kinds of rubber goods except rubber footwear, hot water bottles, syringes, and dental goods. Tires and tubes are made by the Hungarian Rubber Goods' Factory only. This concern employs about 2,000 men besides office staff. The Dorogi firm employs some 500 men.

Hungary's chief imports in 1923 were: Footwear, 73.2 metric

tons, of which America supplied only 3.7 tons, while Austria sent 46.1 tons, Germany 12.6 tons, Great Britain 7 tons and Russia 2.8 tons; tires, 108.3 metric tons, of which 2.6 tons came from America against 57 metric tons from Germany, 33.2 tons from Austria and 9.2 tons from France. The most popular foreign tires are Continental, Semperit, and Michelin. The market for American goods is obstructed by import restrictions and trade agreements with Austria and Germany. Hungary exports chiefly heels, soles, and soft rubber toys.

Latvia

It is reported that a large foreign group has applied to the Latvian Government for permission to found a large rubber factory in Riga. Most of the capital appears to be Dutch.

The Riga Rubber Factory Continent will resume activities with modern equipment, it is learned. The factory has been taken over by the Prowodnik and the entire management, business and technical, is in the hands of this concern. The products will include galoshes, surgical and technical goods, hose, toys, balls, vehicle tires and rubberized fabrics.

Russia

In order to assist the rubber industry, the Russian Government is understood to have decided upon a system of export bonuses. These will be in the form of a refund of taxes paid on machinery and raw materials imported for the manufacture of rubber. Refunds of taxes and payment of bonus will not be made in cash but by means of receipts which will be accepted as payment of import duties on material required by the rubber industry.

Czecho-Slovakia

At the 16th International Automobile Exhibition held in Prague during April 19 to 27, 1924, the rubber industry was particularly well represented. The following brands of tires were seen there: Michelin, Dunlop, Jenatzky, Pirelli, Goodrich, Goodyear, Bergougnan, Semperit, Continental, Hutchinson, Cordial, Avons, Rapson. Much interest was shown in the local Semperit cord tires, which were of excellent quality.

A TRINIDAD RUBBER ESTATE

In the May issue of *Tropical Agriculture*, the journal of the Imperial College of Tropical Agriculture, Trinidad, appear some interesting notes on a successful rubber estate on the Island. This is the Non Pareil Estate, Sangre Grande, owned by E. A. Robinson, who also owns and manages large areas of cacao, coconuts and sugar.

The rubber plantations consist of about 40,000 trees covering some 170 acres and occur in blocks on certain sections in cacao which are too poor for the latter crop. The rainfall is about 100 inches per annum and there is a dry season from February to May, inclusive.

Planting was begun in 1912 under difficult circumstances, as everything had to be learned by experience and from literature on the subject. However, difficulties were overcome and Mr. Robinson finally succeeded also in training an efficient force of tappers.

Tappers are paid 40 cents a task of 200 trees; 30 cents per 100 trees is paid for marking trees prior to tapping. Alternate day tapping is the rule and the maximum amount of rubber brought in per man per day is 5 to 6 pounds from mature trees. All tapping is stopped during the dry season. This estate can produce rubber and place it on the market in London at 10½*d.* per pound. The rubber is good quality smoked sheet. The estate has the advantage of low transportation costs, and costs of supervision are also low, as the rubber is part of a large organization. The yield from 9-year-old trees is 2 pounds of dry rubber per tree per annum. The trees suffer occasionally from leaf disease, but so far this disease has not given any serious trouble.

Foreign Tariffs

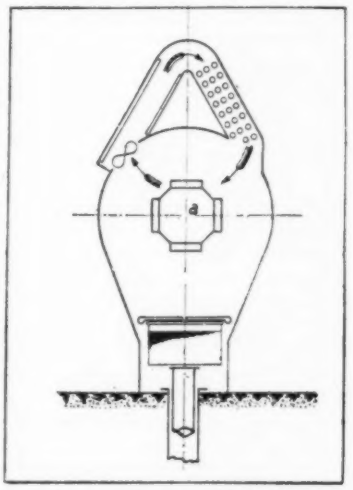
The Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., has recently issued the following special circulars regarding foreign customs tariffs:

Circular No.	Country	Articles
*479	Norway	Rubber Goods
**480	Australia	Rubber Goods
***484	Colombia	Rubber Goods
488	Ecuador	Rubber Goods
493	Paraguay	Rubber Goods
****494	Mexico	Rubber Goods
496	British Guiana	Rubber Goods
†499	Spain	Rubber Goods
††502	Dominican Republic	Rubber Goods
†††503	Venezuela	Rubber Goods
508	Union of South Africa	Rubber Hose
††††510	France	Rubber Goods
514	Irish Free State	Rubber Goods

*Canceling Special Circular No. 368.
**Canceling Special Circular No. 52.
***Canceling Special Circular No. 59.
****Canceling Special Circular No. 137.
†Canceling Special Circular No. 64.
††Canceling Special Circular No. 205.
†††Canceling Special Circular No. 148.
††††Canceling Special Circular No. 445.

DIPPING AND SOLVENT RECOVERY MACHINE

A diagrammatic section is here shown illustrating the arrangement of a German enclosed machine for making dipped goods and automatically recovering the solvent. The dipping forms are mounted on a four-sided reel which is arranged to revolve over the tank containing the dissolved rubber. The forms in successive groups are dipped in the rubber solution as each side of the form reel is faced in turn toward the tank, which is raised and lowered hydraulically.



German Dipping Machine

The solvent fumes from the freshly dipped articles are driven by fan through to a water cooled condenser, from which they are drawn off. The air passes on through a heating system and returns to the dipping chamber, where it again absorbs the solvent vapors. Two-thirds of the solvent used is said to be recovered by this system.—Rückgewinnung vergasender Löseflüssigkeiten, G. m. b. H., Hamburg, Germany.

DURING APRIL ENGLAND IMPORTED 78,089 PAIRS OF AMERICAN-made canvas shoes with rubber soles, at a value of $60,477. Other leading purchasers were Mexico, taking 41,622 pairs, value $32,442; Denmark, 26,696 pairs, value $22,150; Cuba, 19,851 pairs, value $13,122; the Philippine Islands, 17,136 pairs, value $15,335; and Canada, 10,588 pairs, value $8,967.

THE DUNLOP RUBBER CO., LIMITED, OF ENGLAND, REPORTS profits from all sources in 18 months to December last of £1,915,608 after interest on debentures, etc., £463,815. A net profit, not taking into consideration the deficit of the American company in 1923, totaled £1,451,792. It is reported that the sales and manufacturing departments of the English company are to be reorganized.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

Bud Grafting Experiments

THE REPORT of the third annual meeting of the Prang Besar Estate, Ltd., makes interesting reading. This estate is the only one, besides the land of the Malayan American Rubber Co., on which budded trees have been planted on an extensive scale in Malaya. The area is 1,925 acres, of which 1,125 acres are planted and 800 acres comprise reserve jungle. This jungle will be kept in reserve until very high class material is available for planting.

It is the aim to secure abnormally high yields; top soil has been retained, weeding is cheaply and efficiently done, while the planting has been carried out on scientific principles. The whole of the planted acreage is made up of an equal number of budded trees and trees from seeds gathered from carefully selected high-yielding trees. These trees are planted 200 to the acre to allow thinning out of the poorest yielders.

These methods have cost nearly $20 (Straits currency) per acre more than ordinary methods. It is hoped in 2½ to 3 years' time to be able to obtain guaranteed planting material from the estate for planting the jungle and also for selling to other estates.

The chairman, Major Gough, is thoroughly optimistic regarding bud grafting. He considers an eventual yield of 1,000 pounds per acre a conservative estimate, and warns Malayan planters that Malaya will one day awake to find she is automatically restricting 100 per cent if proper steps are not taken to increase the average yield per acre by preparing material for planting new areas on up-to-date methods.

Noteworthy are his remarks regarding the recently passed law fixing at 400 pounds the maximum output per acre which will be permitted to be reckoned when restriction allowances are assessed: "Under the present law," he says, "there is no inducement to cultivate high-yielding areas, and the law, if its continuance is persisted in, will certainly strangle progress."

Apropos of restriction, in his opinion, the Dutch refuse to cooperate because they are planning to open up large areas in Sumatra and plant it up with high-yielding material and eventually knock out native rubber and Malayan rubber too, if Malaya remains supine.

H. C. Pinching's report of his investigations of bud grafting in Java and Sumatra is rather less optimistic than are Major Gough's views. Mr. Pinching regards bud grafting as being still in an experimental stage.

He admits that there is something in the new method and does not discourage experimenting by estates, but caution is his watchword.

New Uses for Rubber

Soon after the rubber slump set in, it was realized by a few clear-headed persons that the real remedy was in new uses for rubber. From Ceylon first came the idea of making crêpe soles and of marketing them abroad. In 1923 over 2,000 tons of rubber were used for soles.

Inventors have spent a lot of energy on the task of perfecting paving blocks. At Kuala Lumpur Caulfield blocks have been used but they are not satisfactory. The blocks used in Singapore appear to be giving better service. Rubber mats are made by quite a few firms in the Orient. In Malaya the best-known concerns making these goods are the Kinta Rubber Works, Ipoh, and the Chinese firm of Tan Kah Kee & Co., Singapore. This Chinese firm now employs over a thousand persons and produces Ford tires, cycle tires by the Doughty process, tubes, soles and heels, carriage tires, various mechanical goods, and footwear. A big export trade is carried on with China, Java, India and Burma, etc. The firm has its own retail stores: three in Singapore, four in different parts of Malaya, four in Java, one each in Rangoon, Calcutta, Colombo, and three in Shanghai. Recently, invention privileges in regard to manufacture of inner tubes of pneumatic tires direct from latex have been granted to Mr. Tan Kah Kee.

Rubber Lining for Mining Launders

Mention should be made of the interest being shown in the use of rubber in mining operations. J. S. M. Rennie reports definite inquiries from the largest mining groups on the Rand (Transvaal, South Africa) regarding the possibility of securing sheets of crude rubber somewhat similar to sole crêpe, in special lengths and with definite ridges or grooves. These are required for lining launders and covering the tables which collect the concentrates in the gold mining industry. This new use of rubber is advantageous to the gold, platinum, and tin mining industries for dredge and other launders, riffles and wash boxes.

In the Malayan tin industry rubber liners for tail chutes are being tried out: at Taiping they have been in use for the last 12 months and have proved very successful. At Tekka Taiping some have been tried for about 8 months and show very little wear and tear. Ordinary crêpe 7/8 to an inch thick was used in short lengths at first. After they were vulcanized into one long piece, very much better results were obtained.

Cooperative Selling

The news that the Rubber Growers' Association is making renewed efforts to establish a cooperative selling agency in view of the American threat of cooperative buying, has been received with interest. It is felt that while the Dutch refuse to join in restriction they may enter into a scheme for controlling sales of rubber. In this connection, *The Malayan Tin & Rubber Journal* reminds its readers of the favorable reception a former price-control plan received from the Dutch.

What the further developments will be is hard to foretell. Anti-restrictionists are eagerly prophesying that the restriction cure will soon be dropped to make place for the new remedy.

Ceylon

Although details are still lacking as to what form of organization is proposed by the Rubber Growers' Association for centralizing the selling of rubber, the subject is being widely discussed. Since no producers in Colombo appear to have been approached in connection with the scheme, it is presumed that a system of London control is planned.

Representative merchants in Colombo are of opinion that price control is practicable provided that sufficient support is forthcoming. To what extent this support should go is a point on which there is not so much agreement. One well-known merchant considers that taking for granted the world consumption is 400,000 tons, it would be sufficient to control the selling of 200,000 tons to secure an economic price to the sellers taking part in the centralized selling organization.

That is, the scheme is feasible with 50 per cent support, provided suitable financial arrangements are made for tiding over any period when cheap stocks may be for disposal. Another authority, while equally confident of success for the scheme, if properly supported, feels that support should be from 90 to 95 per cent. At the same time he does not doubt but what the scheme will get this backing. He also suggested that if a selling organization were formed in London efforts would be made to establish a similar organization in Ceylon.

Planting Notes

At the annual general meeting of the Rubber Research Scheme at Kandy, F. A. Stockdale, Director of Agriculture, touching upon the question of bud-grafting, gave it as his personal opinion that the scheme should concentrate on the budding of rubber and make the fullest investigations. He does not believe that for future plantations absolute dependence should be placed on seedling stocks, whether selected or not.

He also referred to the danger of secondary leaf-fall to the Ceylon rubber industry and pleaded for its most careful study, not only from scientific workers but also from all rubber estate superintendents and visiting agents. Owing to the extremely heavy rainfall during 1923, secondary leaf-fall and pod-rot were very prevalent. Ratnapura district, which normally does not experience bad attacks of this disease, suffered rather heavily this year. In Kalutara and Kelani Valley many estates lost at least 25 per cent of the normal foliage, and it was the exception to find a seed capable of germination.

Experiments with manuring to overcome the trouble are being undertaken. It has been suggested that manuring combined with a longer period of rest after wintering would do much to prevent the condition.

At the Peradeniya Experiment Station tapping tests showed that among trees tapped daily on alternate months 13 per cent of the trees showed positive symptoms of brown bast or had gone dry, against 4 per cent of the trees tapped on alternate days. However, bark renewal appears to be superior in the trees tapped daily on alternate months.

Netherlands East Indies

Cooperation with British Necessary

With the steadily decreasing prices there is a growing feeling for the need of cooperating with the British in the matter of restriction. It is learned that Mr. Schrieke, the Director of the Bandoeng Advisory Bureau for Agricultural matters, has declared that the planters and directors in Java are practically unanimously in favor of restriction. The only ones to hold back yet are the government and the Netherlands directors.

However, the situation is such that these parties will have to reconsider their attitude. Should the conditions of 1922 repeat themselves now, the effect on the economical situation in the Dutch East Indies would be serious, for rubber has since taken the second position in the list of local exports and forms 10 per cent of the total.

Then the Netherlands directors have really a small part of the local industry in their hands and their slogan, to fight to the bitter end, has become impossible now in view of the extent of the native plantings.

This is the view of the *Deli Courant*, which adds that a further decrease in price will probably be necessary before the Dutch opponents of restriction will experience a change of heart. But such a decrease would be not objected to if it brought about the desired unity among rubber producers.

The mode of cooperation would have to be considered. A 25 per cent restriction for the European estates is suggested and an export tax of say 25 Dutch cents per kilo on native rubber.

Another question would be the advisability of restricting or prohibiting the further planting of rubber. A portion of the revenue derived from taxing native rubber would have to be used to check or prevent smuggling.

Control of Rubber Prices

Mr. Hoover's utterances on the subject of foreign price combinations with special reference to rubber, and his intimations of legislation of a retaliatory nature have caused a flurry of excitement here. The declaration is considered a threat against which it becomes necessary for producing countries to prepare themselves.

The *Nederlandsch-Indisch Rubber en Thee Tijdschrift*, which had consistently opposed restriction for Java, now says:

"We shall be glad if the directors of those Dutch companies, which up to the present have adopted a hostile attitude toward the efforts of our English neighbors to bring prices to a remunerative level, will find in this common menace occasion to change their views and to make common cause against the danger, by no means imaginary, of being delivered up to the good pleasure of our biggest customer.

"Let us hope that the mailed fist of Mr. Hoover will be able to shake up the entire rubber planting community so that they may put aside differences of secondary importance, and often of purely academic value, in order to combat the common danger shoulder to shoulder."

Tax on Native Rubber

Whether the taxing of native rubber will go through has not yet been decided. In the first place, it seems that some time ago a certain sum of money was reserved for the purpose of extending the inspection in the Department of Finances with a view to facilitating the difficult task of collecting income tax from the well-to-do natives. This does not appear to have met with much success, but all the same the government is of opinion that it would be unfair to make the natives pay both income tax and export duty on rubber.

If this tax on rubber should go through, a lot of trouble is foreseen, for rubber will not be taxed at its source but at the ports of shipment, and there is no need to doubt that there will be much new smuggling, bribery and corruption.

On the other hand, this duty would automatically help Malaya, for the rubber smuggled from Malaya is brought to Sumatra and then reshipped as Dutch rubber. Smugglers from Malaya would then find they were jumping out of the frying pan into the fire.

Leaf Gutta Percha

Up to the present the government estate, Tjipetir, the only estate where leaf-gutta is produced, was chiefly dependent on the demands for gutta percha for insulating submarine cables.

During the war, and also the first years after the war, so many cables were laid and repaired that the Tjipetir production was easily disposed of at the highest prices. However, the world-wide slump which followed affected the cable industry, too, so that from 1921 unsold stocks of gutta began to accumulate, continuing to the end of 1922. This caused an investigation of other markets for gutta and fortunately it was soon discovered that gutta percha could successfully be used for a number of articles in which balata was used. As a result of this and partly owing to the fact that the demand for gutta percha insulations revived, not only were the accumulated stocks and the 1923 output sold, but a large portion of the 1924 and 1925 crops were sold forward at profitable prices.

DURING THE YEAR 1923 THERE WERE APPROXIMATELY 4,000,000 motor vehicles produced in the United States, almost 400,000 of these being built for commercial purposes. The total number of motor vehicles manufactured in the year 1912 has been estimated at only about 375,000.

IN PURCHASES OF AMERICAN-MADE BATHING CAPS ENGLAND during the first four months of 1924 has outstripped other countries, taking goods valued at $58,985. Other leading customers have been Canada, the Netherlands, France, Denmark, Sweden, and Switzerland.

DURING THE FIRST TWO MONTHS ONLY OF THE PRESENT YEAR Japan, at $247,594, has already almost exactly doubled the value of her purchases of American automobile casings for the entire year 1922, or $123,792. The figures for January and February, 1924, are $130,266 and $117,328, respectively.

Recent Patents Relating to Rubber

The United States

Issued* May 13, 1924

NO. 1,492,505 Unitary bathtub and dressing-table structure. Robert L. Smith, Brooklyn, N. Y., assignor to New York Bath Manufacturing Co., New York, N. Y.

1,493,658 Automobile tire, rim and fastening means. James H. Wagenhorst, Akron, Ohio.

1,493,672 Tire tube. Albert E. Henderson, Toronto, Ontario, Canada.

1,493,674 Pneumatic tire casing. Ernest Hopkinson, New York, N. Y.

1,493,702 Inner tube. Martin Rasmussen, Racine, Wisconsin.

1,493,712 Valve dust cap. Meyer Stein, Springfield, Illinois, assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,493,715 Tire gage. P. E. Welton, Cuyahoga Falls, Ohio, assignor to Tiregage Valve Corp., Charleston, West Virginia.

1,493,716 Tire gage. P. E. Welton, Cuyahoga Falls, Ohio, assignor to Tiregage Valve Corp., Charleston, West Virginia.

1,493,764 Rubber valve-stem cap. T. R. Palmer and A. E. Caldwell, assignors to Continental Rubber Works, all of Erie, Pennsylvania.

1,493,922 Vehicle Tire. E. Deister, Fort Wayne, Indiana.

1,493,923 Vehicle Tire. F. Deister, Fort Wayne, Indiana.

1,494,001 Combined dust cap and tire gage. H. L. McPherson, assignor of one-half to P. L. Mitchell, both of Memphis, Tenn.

1,491,044 Sheet rubber sanitary step-in. A. Ward and J. W. Goldsmith, both of New York, N. Y.

1,494,060 Waterproof sanitary protective covering. O. V. Camp, Denver, Colorado.

1,494,086 Rubber corset. J. A. Weil, New Haven, Conn.

1,494,137 Fire valve. M. C. Schweinert, New York, N. Y.

1,494,179 Spoke-covering means. J. S. Matthew, Sutton Coldfield, assignor to The Dunlop Rubber Co., Ltd., Regents Park, London, both in England.

1,494,198 Spring inner tube. W. J. Szczepaniak, Marche, Arkansas.

Issued* May 20, 1924

1,494,337 Tire protector. M. A. Boylan, assignor to Boylan Tire & Rubber Co., both of Omaha, Nebraska.

1,494,578 Tire valve dust cap. J. G. Bjork, Oakland, California.

1,494,592 Vulcanized disk wheel. E. Deister, Fort Wayne, Indiana

1,494,621 Removable tread tire. J. S. Ogilvie, Wood Green, England.

1,494,633 Artificial foot with detachable rubber envelope. J. F. Rowley, Chicago, Illinois.

1,494,680 Covered elastic fastener. K. Fisk, Los Angeles, California.

1,494,692 Non-slipping step-ladder shoe. W. A. Lohlker, Pasadena, Calif.

1,494,782 Flanged printing plate. F. C. Goldenbaum, Kearney, N. J., assignor to International Printing Plate Co., Inc., New York, N. Y.

1,494,797 Sectional tire and rim. L. W. Nimschke, Old Bridge, N. J.

1,494,809 Dental syringe. B. F. Sahr, Hutchinson, Minn.

1,494,888 Rim for elastic wheel tires. F. E. Clark, Huntington, West Virginia.

1,494,901 Life preserver. Frank Giudice, New York, N. Y.

1,494,920 Corset with elastic section. D. Kops, New York, N. Y., assignor to Kops Brothers, Inc., both of New York, N. Y.

1,494,946 Rubber heel. W. Bernstein, Jamaica Plain, Mass., assignor to Panther Rubber Mfg. Co., Stoughton, Mass.

1,495,056 Corset with elastic fabric portion. C. B. Whitney, assignor to Royal Worcester Corset Co., both of Worcester, Mass.

1,495,083 Cushion tire. F. A. Krusemark, assignor by mesne assignments to L. A. Clark, both of Roanoke, Virginia.

Issued* May 27, 1924

1,495,306 Tire armor. G. Harford, Kansas City, Missouri.

1,495,535 Necktie with elastic band. L. M. Scott, Auburn, Me.

1,495,599 Automatic tire gage. H. A. Konkowski, assignor of one-half to M. V. Konkowski, both of Chicago, Illinois.

1,495,665 Tire cover. E. E. Bigelow and P. Thompson, Pontiac, Michigan.

1,495,709 Pneumatic horse collar. C. B. Mayfield, Warsaw, Illinois.

1,495,768 Cushion tire. C. H. Braden, assignor to National Airless Tire Co., both of Los Angeles, Calif.

Issued* June 3, 1924

1,496,018 Protecting device for deflated tires. A. L. Putnam, Detroit, Michigan, assignor to Detroit Pressed Steel Co., Wilmington, Delaware.

1,496,034 Wheel rim. E. Stuck, assignor by mesne assignments, to Budd Wheel Co., both of Philadelphia, Pa.

1,496,086 Tire casing. W. E. Gilmore, Euclid, Ohio.

1,496,114 Pneumatic tire. C. E. Bonner, New York, N. Y., assignor to Rennobec Co., Dover, Delaware.

1,496,164 Tire carcass. H. I. Morris, Los Angeles, California, assignor to The Cord Tire Machine Co., Cleveland, Ohio.

1,496,197 Eraser structure. John Auld, Chicago, Illinois.

1,496,226 Shoe heel. C. H. Ingwer, assignor to the I. T. S. Rubber Co., both of Elyria, Ohio.

1,496,235 Vehicle wheel comprising rubber balls. C. A. La Grave, Hood, Calif.

1,496,255 Reducing brassiere. B. Cervelli, San Francisco, Calif.

1,496,414 Horseshoe pad. G. J. Heymoss, Jr., Detroit, Michigan.

1,496,578 Corset with elastic insert. D. Kops, assignor to Kops Brothers, Inc., both of New York, N. Y.

1,496,587 Life-saving suit. J. F. Mordica, Philadelphia, Pa.

1,496,623 Wheel rim. C. F. Christopher, Asheville, N. C.

1,496,761 Tire valve. L. Greenwald, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted May 14, 1924

239,976 Tire valve gasket. E. A. Daubenspeck, Lance Creek, Wyoming, U. S. A.

240,011 Fabric reinforced tire tube. E. B. Killen, London, E. C. 4, England.

240,129 Cushion tire. H. T. Henry, assignee of C. H. Braden, both of Los Angeles, California, U. S. A.

Granted May 20, 1924

240,165 India rubber game mat. M. M. Dessau, London, England.

240,271 Pneumatic tire. The Dunlop Rubber Co., Ltd., London, assignee of C. Macbeth, Birmingham, Warwick, England.

240,292 Life-saving suit. The National Life Preserver Co., assignees of O. A. Youngren, both of New York, N. Y., U. S. A.

240,293 Life-saving suit. The National Life Preserver Co., assignee of O. A. Youngren, both of New York, N. Y., U. S. A.

240,323 Wheel rim. The Goodyear Tire & Rubber Co., assignee of J. B. Atkins, both of Akron, Ohio, U. S. A.

Granted June 3, 1924

240,517 Cushion tire. H. G. Westgate and L. B. Westgate, coinventors, both of Union, New York, U. S. A.

240,543 Demountable rim. W. N. Booth, Detroit, Michigan, U. S. A.

240,545 Demountable rim mechanism. W. N. Booth, Detroit, Michigan, U. S. A.

240,546 Demountable rim. W. N. Booth, Detroit, Michigan, U. S. A.

240,566 Pneumatic tire cover. C. J. Escoto, Havana, Cuba.

240,579 Cord tire. A. A. Holle, Paddington, London, England.

240,629 Closet seat bumper. The Canadian Brass Co., Ltd., Galt, Ontario, Canada, assignee of T. J. Florey, Washington, New Jersey, U. S. A.

The United Kingdom

Published May 7, 1924

212,609 Removable tread tire. J. S. Ogilvie, The Orchards, Burley, Brockenhurst, Hampshire.

212,637 Foot arch supports of rubber, etc. W. H. Wakfer, 67 Whitworth Road, South Norwood, London.

212,652 Syringe plunger with sponge rubber section. F. H. Bull, 73, Chiswell St., London.

212,699 Clothes pegs of rubber or other material. G. H. Hannay and E. A. Hannay, 22 Hambalt Road, Clapham Common, London.

212,737 Foot-arch support of rubber, etc. E. Seavey, 359 Pearl St., New York, U. S. A.

212,738 Disk wheel with rubber sleeves for belts. T. Nuttall, J. L. Nuttall, and R. Nuttall, all of 532 Romford Road, Goodmayes, Essex.

212,758 Three wheel roller skate. R. Schlinder, 46 Bromehead St., Stepney, London.

212,762 Pull-chain handle with rubber buffer. E. Darrah, 41 Miller St., and H. Robinson, 21 Mayfield Road, Whalley Range, both in Manchester.

212,795 Cushioned horseshoe. W. T. Face, Ashbury Cottage, Earlswood, Hockley Heath, near Birmingham.

212,799 Waterproof guard for outlets discharging liquids. A. R. Henry, 39 Victoria St., Westminster.

212,916 Tire pressure gage. W. Trewhella, Trentham, Victoria, Australia.

Published May 14, 1924

212,964 Motorcycle driving belt. Dunlop Rubber Co., Ltd., 1 Albany St., Regent's Park, London, and W. H. Paull, and F. Fellowes, Fort Dunlop, Erdington, Birmingham.

213,028 Pneumatic massage appliances. G. F. Sugden, 38 Queen St., Chester.

213,058 Sound box case with rubber washers. M. A. Renison, 36 Dennington Park Road, West Hampstead, London.

Chemical Patents will be found on page 658, Machinery and Process Patents on pages 663-664

213,085 Instep support. A. Cant, Auvergne, Maule St., Carnoustie, Forfarshire, E. Sallows, Fairfield, Arbroath Road, Carnoustie, Forfarshire, and H. Neal, Sunset, Cooden, Sussex.

213,121 Rubber soles and heels with attaching studs. J. Brandwood, Brandlesholme, Bury, Lancashire.

213,122 Rubber soles and heels with projecting rubber studs. E. R. Barltrop, 58 St. Michael's Road, Northampton.

213,142 Fountain pen with rubber piston packing. A. Munro, 65 Preston Road, Winson Green, Birmingham.

213,172 Rubber grip for golf clubs. W. Dell, 33c Hallam St., Great Portland St., London.

213,183 Strainer and splash preventer for taps. F. C. Jones, 29A Charing Cross Road, London.

213,193 Golf ball. Dunlop Rubber Co., Ltd., 1 Albany St., Regent's Park, London, and A. E. Penfold, Fort Dunlop, Erdington, Birmingham.

213,198 Tire with rubber-ball studded core. J. Kiernan, 3 Hill St., Newmarket, Auckland, New Zealand.

213,204 Shoe with elastic closing strips. A. C. Hanson, 1210 Lafayette St., Fort Wayne, Indiana, U. S. A.

213,254 Cupping-appliance with rubber mouthpiece. H. P. Bosreden, 56 Boulevard St. Jacques, Paris, France.

213,261 Swimming device. J. Weiss, Pompton Plains, New Jersey, U. S. A.

Published May 21, 1924

213,321 Medical syringe. J. W. Smith, 510 Albert St., East Melbourne, Victoria, Australia.

213,335 Life saving device. M. D. Boddy, 12 Dartmouth Place; G. M. Boddy, 9 Royal Parade, and E. P. Boddy, 12 Dartmouth Place, all in Blackheath, London.

213,390 Boot heel. A. A. Crozier, 75 Lansdowne Road, West Didsbury, Manchester.

213,428 Ball cleaning device. C. Harrison, R. C. Harrison, N. C. Harrison and G. Norris, all of 71 Bedford St., Leamington Spa, Warwickshire.

213,436 Horseshoe pad. C. H. Young, 14 Brow Cottages, Half House Lane, Hove Edge, Lightcliffe, and R. Schofield, 3 Station View, Hipperholme, both near Halifax, Yorkshire.

213,505 Splash guard. J. Shaw, 11 Marsland St., Hollinwood, Oldham.

Published May 28, 1924

213,591 Air cooled inner tube. M. J. C. André, 165 Rue de Tolbiac, Paris, France.

213,637 Vacuum cup. H. J. Poole, 49 Wells St., Oxford St., London.

213,639 Substitute for inner tube. G. O. B. Hackett, of West London Scientific Apparatus Co., Premier Place, High Street, Putney, London.

213,670 Tire mud guard. G. H. Dolby, 38 Brettell St., Dudley, Worcestershire.

213,701 Mud guard for tires. F. Duffy, 55 Hamilton St., Govan, Glasgow.

213,741 Crêpe rubber table mat. F. F. Dell, 42 Baker St., London.

213,745 Rubber inserts for soles. G. W. Clarke, 23 Langham Place, and Hornby & West, Ltd., Wycliffe Road, both in Northampton.

213,757 Splash guard. J. A. Coia, 88 Drumover Drive, Parkhard, and L. Denati, 12 Rose St., Garnethill, both in Glasgow.

213,762 Rubber ambulance stretcher. A. H. Huddart, The Retreat, Chalk Road, Godalming, Surrey.

213,773 Rubber lined tobacco pouch. G. R. Keeys and Keeys & Co., Ltd., 1 St. George's Ave., Aldermanbury, London.

213,782 Rubber horseshoe calks. W. H. Turner, 41 Corporation St., Halifax, Yorkshire.

213,794 Inner tube comprising balls or pieces of rubber. A. J. Watson, 119 Geraldine Road, West Side, Wandsworth Common, London.

213,812 Rubber insulated handle. G. Klauke, Alderstrasse, Remscheid, Germany.

213,826 Rubber cored razor strop. S. E. M. Prout, 25 Edith Ave., Lipson, Plymouth.

213,863 Rubber channels for vehicle windows. H. L. Sleigh, and A. S. Cheston, 1 Mary Ann St., St. Pauls Square, Birmingham, assignees of Soc. Driguet Freres, 66 Boulevarde de l'Hopital, Paris, France.

213,865 Tobacco pouches. F. E. Rowland, 18 Compayne Gardens, Hampstead, London.

213,875 Bathing cap. L. Auster and M. Auster, 104 West 94th St., New York, U. S. A.

New Zealand

Published April 17, 1924

51,571 Inner tube. E. B. Killen, 27 Queen Victoria St., London, E. C. 4, England.

Germany

Patents Issued, With Dates of Issue

395,786 (May 4, 1923). Injection syringe. Dr. Paul Leopold, Günthersburg-Allee 14, Frankfort-am-Main.

395,882 (July 6, 1920). Non-skid device for preventing sinking of rubber tired wheels, consisting of a detachable belt with suspended tread shoes. Societa Italiana Cingoli, Milan, Italy; represented by W. Riese, Charlottenburg.

396,024 (December 1, 1922). Rubber sole. Max Götze, Biesterstrasse 6, Hannover.

396,147 (September 27, 1923). Rubber tread patch. Walter Endler, Stralsund.

396,540 (April 21, 1923). Rubber tread patch. Reinhold Gollert, Neue Schönhauser Strasse 20, Berlin.

396,769 (March 1, 1922). Inner tube. Paulli Harder, Copenhagen, Denmark; represented by: A. Bursch, Berlin, W. 8.

396,940 (January 31, 1922). Elastic belt band for suspenders, gartera and the like. Radium Gummiwerke, G. m. b. H., Köln-Dellbrück.

Design Patents Issued, With Dates of Issue

869,332 (February 21, 1924). Rubber soles. Hansa, G. m. b. H., Munich.

869,378 (March 13, 1924). Substitute for leather hat linings. Continental-Caoutchouc-und Gutta-Percha-Compagnie, Hannover.

869,404 (October 10, 1922). Rubber toy. Max Manfred v. d. Heyden, Leipziger Strasse 119-120, Berlin.

869,427 (February 25, 1924). Inflatable rubber toy. Bernhard Meyer, Innere Klosterstrasse 23, Chemnitz.

869,797 (March 18, 1924). Rupture band. Adolf Hoyer, Klosterstrasse 3-5, Hamburg.

869,920 (January 21, 1924). Tire valve. Continental-Caoutchouc-und Gutta-Percha-Compagnie, Hannover.

869,973 (March 17, 1924). Packing ring for bearings. Nya Aktiebolaget Lagerpackningsringar, Stockholm, Sweden; represented by: M. Wagner and Dr. G. Breitung, Berlin S. W. 11.

870,009 (December 13, 1923). Device for attaching movable solid or semi-solid rubber limbs to rubber-doll bodies. Rheinische Gummi-und Celluloid-Fabrik, Mannheim-Neckarau.

870,041 (March 4, 1924). Rubber body for jointed doll. B. Polack, A.-G., Waltershausen in Thuringia.

870,056 (March 11, 1924). Sanitary binder. Paul Lange, Kaiser Wilhelmstrasse 53, Dusseldorf.

870,097 (March 20, 1924). Inhaling apparatus. Eugen Sütterlin, Weil, Kr. Lörrach.

870,167 (March 15, 1924). Rubber button. Sachsland Gummiwarenfabrik, Bürgel.

870,490 (March 22, 1924). Clothes hanger with rubber cross-piece. Johann A. Müller, Königstrasse 56-57, Berlin.

870,593 (March 25, 1924). Rubber sole. Ernst Huck, Prenzlau.

870,670 (March 21, 1924). Device for attaching rubber nipples to feeding bottles. Ludwig Bode, Neuhausel, Westerles.

870,760 (March 21, 1924). Rubber soles and heels. Terma-Gummiwerke, G. m. b. H., Wunstorf bei Hannover.

870,822 (March 5, 1924). Rubber sole for tennis and gymnasium shoes. E. Hauser, Friedenstrasse 7, Karlsruhe.

871,142 (March 14, 1924). Joker rubber flower. Sachsland Gummiwarenfabrik, Bürgel in Thuringia.

871,257 (March 27, 1924). Brush having rubber threads instead of bristles. Emsa Werke, Rostock i. M.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted May 13, 1924, Act of February 20, 1905

184,008 The words: SPARTAN CORD, describing an arc of a circle and separated by the words, in very small type, ARMOR TREAD; these in turn separated by a small shield inscribed with the letter S—Rubber tires. Spartan Rubber Co., Trenton and Yardville, New Jersey.

Granted May 13, 1924, Act of March 19, 1920, Section 1(b)

184,045 TONSOR—hard rubber combs. American Hard Rubber Co., Hempstead and New York, N. Y.

184,053 RU-BER-OID—bituminized roofings, floorings and building papers. The Ruberoid Co., Boundbrook, New Jersey, and New York, N. Y.

184,054 Representation of a man standing in back of and with hands on a roll of Ru-ber-oid roofing—bituminized roofings, floorings, and building papers. The Ruberoid Co., Boundbrook, New Jersey, and New York, N. Y.

184,057 The words: OUT SIZES—shoes of leather, canvas, and rubber, or a combination of these. W. B. Coon Co., Rochester, New York.

184,059 Within a rhombus the words, in curiously distinctive lettering: THE BOLLWAY CO., INC.—shoes and moccasins of leather and fabric, and combinations of leather and fabric and fabric and rubber. The Bollway Co., Inc., Syracuse, New York.

Granted May 20, 1924, Act of February 20, 1905

184,261 GARLOCK—packing and packing material made of or containing asbestos, rubber, cotton, flax, copper, lead, iron, and babbitt. The Garlock Packing Co., Palmyra, New York.

184,325 KEMIKAL WELD-IT, in distinctive lettering—outfits for repairing tires and rubber goods. C. L. Montgomery, Memphis, Tennessee.

Granted May 20, 1924, Act of March 19, 1920, Section 1(b)

184,419 Against a circular background, black except for simulated perforations around the border and a central perpendicular white strip, the word: NORVND, within a parallelogram having notched corners—sanitary belts, sanitary aprons, and sanitary napkins. Sears, Roebuck & Co., Chicago, Illinois.

184,443 YOUNG'S—leggings, spats, boots, shoes, etc., of leather, rubber, fabric, or combinations, and hose. Young Shoe Co., Los Angeles, California.

Granted May 27, 1924, Act of February 20, 1905

184,473 FAULTLESS WONDER—nursing nipples. The Faultless Rubber Co., Ashland, Ohio.

184,526 TRUWAUK, the letters graded in size so that the largest are at the ends—shoes, etc., of leather, fabric, and combinations of these and of leather, fabric and rubber. Benjamin Ross, Brooklyn, New York.

184,621 2-4-1—playing balls. The Faultless Rubber Co., Ashland, Ohio.

Granted May 27, 1924, Act of March 19, 1920, Section 1(b)

184,713 Within an oval outline the words: THE REYNOLDS SHOE—boots and shoes of leather and combinations of leather, fabric and rubber. Reynolds, Drake & Gabell Co., North Easton, Massachusetts.

184,719 BEVERLY—tires of fabric and rubber and rubber inner tubes. C. Kenyon Co., Inc., Brooklyn, New York.

184,723 Within a block border the words: DRY CLIMATE—fabric reinforced rubber hose. The B. F. Goodrich Co., Inc., New York, N. Y.

Granted June 3, 1924, Act of February 20, 1905

184,741 DEFENDER—reliners, inside tire sleeves, outside tire sleeves, and tires made wholly or partly of rubber. The Federal Rubber Co., Cudahy, Wisconsin.

184,789 Representation of a round medallion crocheted in circles, a design comprising seven circles at center, above which is the word: BABBETTE—boudoir, bathing and dusting caps. Bettie Fleischmann Holmes, New York, N. Y.

184,832 NEMCO—tires and tubes of rubber; valves, valve stems, and parts thereof for tires and radiator hose. New England Mills Co., Chicago, Illinois.

184,853 Sketchy representation of an Indian head, and above it the words, in block letters: INDIAN RED—belting of fabric and rubber and sheet packing containing rubber. The B. F. Goodrich Co., New York, N. Y.

184,862 RAWHIDE—rubber tires, inner tubes, tire flaps, blowout and tube patches. A. I. Levin, trading as Rawhide Products Distributing Co., Kenilworth, New Jersey.

184,867 S & J, with a background comprised of a piston ring and chain links in distinctive arrangement—piston rings. Charles G. Sprecher, trading as The S & J Piston Ring Co., Baltimore, Maryland.

184,882 TAREPROOF—hose supporters and garters. J. E. Rhodes, New York, N. Y.

184,932 PANTHER—rubber heels and soles. Panther Rubber Manufacturing Co., Stoughton, Massachusetts.

184,933 Representation of a panther—rubber heels and soles. Panther Rubber Manufacturing Co., Stoughton, Massachusetts.

184,939 "GLADFLEX"—boots, shoes, overshoes, etc., made wholly or in part of leather, rubber or fabric. Gladding Drygoods Co., Providence, Rhode Island.

184,945 PANTIC—shaped rubber heels, revolving rubber heels, rubber soles, and rubber heel tips. Simpson's (S. A.) Ltd., Johannesburg, Transvaal, South Africa.

184,946 RONOVAR—shaped rubber heels, revolving rubber heels, rubber soles and rubber heel tips. Simpson's (S. A.) Ltd., Johannesburg, Transvaal, South Africa.

184,984 KIDDY KOOL, so arranged that the initial K suffices for both words—infants' waterproof pants. Featherweight Products Corporation, New York, N. Y.

185,006 VARIOLASTIC—elastic webbing in the piece. Kops Brothers, Inc., New York, N. Y.

185,016 ELASTIEBAND—elastic bands used in making neckties. The Governor Fastener Co., New York, N. Y.

185,017 GOVERNLASTIC—belts, belting and elastic used in making neckties, garters and other articles of apparel. The Governor Fastener Co., New York, N. Y.

185,022 COZY—seat pads made wholly or partly of rubber. G. S. Frazier, Sebring, Ohio.

Granted June 3, 1924, Act of March 19, 1920, Section 1(b)

185,063 XTRA-WEAR—rubber water bottles, reducing garments, syringes, and other druggists' rubber sundries. Storer Rubber Co., Boston, Massachusetts.

The Dominion of Canada

Registered

35,497 The word: FLEUR-DE-LYS—balls for games. The Game Balls Co., Ltd., Windmill road, Brentford, Middlesex, England.

35,498 The word: SIGNAL—balls for games. The Game Balls Co., Ltd., Windmill road, Brentford, Middlesex, England.

35,499 The word: SPADE—balls for games. The Game Balls Co., Ltd., Windmill road, Brentford, Middlesex, England.

35,552 The word: RUGATEX—substance composed wholly or partly of rubber, or in which rubber or rubber compositions are component parts, to be used in sheets or molded into various forms for commercial purposes. Gutta Percha & Rubber, Limited, Toronto, Ontario.

35,563 The word: BOBALL—golf balls and golf supplies. Robert Henry Ball, Montreal, Quebec.

35,578 INSTANTON—caps on inflation valves. The Dill Manufacturing Co., Cleveland, Ohio, U. S. A.

35,611 Words: OUR DAISY and the representation of two conventionalized daisies with stems crossed inserted between the words; below this the words: TRADE MARK; elliptically surrounding the design, on a background of darker color appear the words: CANADIAN CONSOLIDATED RUBBER CO., LIMITED; the whole enclosed within an elliptical border of rope design—footwear composed wholly or partly of rubber or rubber substitutes. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.

35,620 GRASSELERATOR—rubber accelerators. The Grasselli Chemical Co., Ltd., Hamilton, Ontario.

The United Kingdom

Published May 7, 1924

B434,122 COLLIER—rubber tires and inner tubes. Collier Tyres, Limited, 7a Lower Belgrave street, London, S. W. 1.

447,045 HERCULES—tobacco pouches of rubber or in which rubber predominates. A. Oppenheimer & Co., 38 Finsbury Square, London, E. C. 2.

Published May 14, 1924

446,029 KINLAN—rubber goods exclusively in Class 40. Harry Soper, trading as H. Soper & Co., 318 Kingsland Road, London, E. 8.

Published May 21, 1924

444,513 VELVUTO, in white letters on a black background, the whole enclosed within an oblong border—rubber floor covering in the nature of floor cloth. The Bath Rubber Mills, Limited, Norfolk Works, Upper Bristol Road, Bath.

446,310 VELO—rubber tiles. Small & Parkes, Limited, Hendham Vale Works, Hendham Vale, Harpurhey, Manchester.

446,464 NILALEKE—rubber hot water bottles. Miller & Ferguson, Limited, Kenmure Works, Amazon Road, Bishopbriggs, Glasgow.

447,100 Comic representation of a man in cap, long coat, and trousers of large checked material, and holding on his outstretched palm an open box on the front of which is the word: MASTER—rubber and gutta percha articles exclusively in Class 40. Gerrard & Co., Limited, 15 to 19 Great Titchfield street, London, W. 1.

Published May 28, 1924

444,598 FIBROK—all goods included in Class 40. Latex Developments, Ltd., 38 Overstone Road, Northampton.

Published June 4, 1924

443,743 ADCO, in white letters on a black triangular background partly embraced by a conventional laurel wreath; beneath the base line of the triangle the words: THE SIGN OF PURITY—rubber and gutta percha articles exclusively in Class 40.

448,118 KREBA—hair wavers and curlers of rubber. Kate Burningham, 39 Kestrel avenue, Herne Hills, London, S. E. 24.

Designs

The United States

Issued May 13, 1924

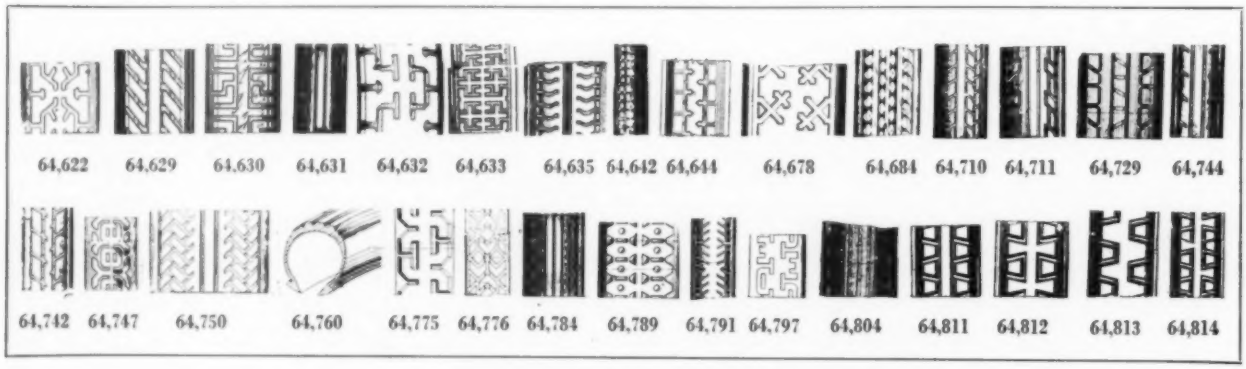
64,622 Tire tread. Term 14 years. H. S. Berlin, assignor to The Victor Rubber Co., both of Springfield, Ohio.

64,629 Tire tread. Term 7 years. M. M. Forma, Philadelphia, Pennsylvania.

64,630 Tire. Term 7 years. J. B. Gabeline, Burlington, assignor to Standard Four Tire Co., Keokuk, both in Iowa.

64,631 Tire tread. Term 14 years. E. B. Germain, assignor to Dunlop Tire & Rubber Corporation of America, both of Buffalo, New York.

64,632 Tire tread. Term 14 years. H. A. Grubb, assignor to The Victor Rubber Co., both of Springfield, Ohio.



64,633 Tire. Term 14 years. E. R. Hall, Quincy, assignor to Hood Rubber Co., Watertown, both in Massachusetts.
64,635 Tire. Term 14 years. H. C. Hower, Chicago, Illinois.
64,642 Tire tread. Term 14 years. W. H. Paull, Hampton-in-Arden, England, assignor to Dunlop Tire & Rubber Corporation of America, Buffalo, New York.
64,644 Tire tread. Term 7 years. C. E. Swan, assignor to Eureka Tire Co., Inc., both of Trenton, New Jersey.

Issued* May 20, 1924

64,678 Tire. Term 3½ years. J. H. Michelin, New Brunswick, New Jersey.
64,684 Tire. Term 14 years. V. A. Parker, J. C. Tuttle, and E. M. Sears, all of Akron, Ohio.

Issued* May 27, 1924

64,710 Tire tread. Term 14 years. R. D. Belden, assignor to Dunlop Tire & Rubber Corp. of America, both of Buffalo, New York.
64,711 Tire tread. Term 14 years. R. D. Belden, assignor to Dunlop Tire & Rubber Corp. of America, both of Buffalo, New York.
64,741 Tire tread. E. B. Germain, assignor to Dunlop Tire & Rubber Corp. of America, both of Buffalo, New York.
64,742 Tire tread. Term 14 years. E. B. Germain, assignor to Dunlop Tire & Rubber Corp. of America, both of Buffalo, New York.
64,744 Rubber boot. Term 14 years. A. A. Glidden, assignor to Hood Rubber Co., Watertown, Massachusetts.
64,747 Tire tread. Term 14 years. E. A. Hecht, Mansfield, Ohio.
64,750 Tire. Term 14 years. E. G. Hulse, assignor to Kelly-Springfield Tire Co., both of Cumberland, Maryland.
64,760 Tire tread. Term 14 years. W. H. Paull and H. L. Buckley, Birmingham, assignors to The Dunlop Rubber Co., Ltd., Regents Park, London, all in England.
64,775 Tire. Term 14 years. E. F. Wait, Akron, Ohio.
64,776 Tire. Term 14 years. E. F. Wait, Akron, Ohio.
64,784 Tire tread. Term 14 years. H. Willshaw, assignor to Dunlop Tire & Rubber Corp. of America, both of Buffalo, New York.

Issued* June 3, 1924

64,789 Tire tread. Term 14 years. J. B. Berardi, Bridgeport, Connecticut.
64,791 Pneumatic tire. W. B. Burns, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
64,797 Tire. Emil Deister, Fort Wayne, Indiana.
64,804 Resilient tire. Term 14 years. O. D. Hollenbeck, assignor to The Racine Horseshoe Tire Co., both of Racine, Wisconsin.
64,811 Tire. Term 14 years. W. F. Pfeiffer, assignor to the Miller Rubber Co., both of Akron, Ohio.
64,812 Tire. Term 14 years. W. F. Pfeiffer, assignor to The Miller Rubber Co., both of Akron, Ohio.
64,813 Tire. Term 14 years. W. F. Pfeiffer, assignor to The Miller Rubber Co., both of Akron, Ohio.
64,814 Tire. Term 14 years. W. F. Pfeiffer, assignor to The Miller Rubber Co., both of Akron, Ohio.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Registered

6,187 Tire tread. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario.
6,188 Tire tread. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario.
6,192 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.
6,193 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.

CUSHIONING EFFECT OF SOLID TIRES

Tests made by the United States Bureau of Public Roads prove that the deflection of motor truck tires under static load is not a reliable measure of their relative shock absorbing qualities especially when the tires compared are not of the same general type.

Relative characteristics typical of solid and pneumatic tires are shown by tests made with a 3½-ton truck, using different tires, and carrying a load of 4½ tons, the testing speed in all cases being 15 miles per hour. This truck was allowed to strike an obstruction 2 inches high and 4 inches wide lying flat on the pavement. The same truck was also subjected to a drop test in which it was caused to drop 2 inches from one level to another. No change was made in the truck except that three different types of tires were used. At one rear wheel the sprung weight of this truck was 5,300 pounds, the unsprung weight 1,700 pounds, and the total load 7,000 pounds.

With worn solid tires the impact force as measured was 26,500 pounds; with new solid tires, 18,700 pounds; and with pneumatic tires, 8,000 pounds, when the truck was run over the 2-inch obstruction. When the same truck was operated in the 2-inch drop test, the impact force developed when using worn solid tires was 23,500 pounds; new solid tires, 17,000 pounds; and pneumatic tires, 8,200 pounds. The results show the remarkable cushioning effect of pneumatic tires.—*Public Roads*, June, 1924, 19.

Rubber Floorings Give Satisfaction

Several steamship lines are now equipping their vessels with "U. S." tile flooring, manufactured by the United States Rubber Co., 1790 Broadway, New York, N. Y., and are finding this floor covering meets every requirement. Particularly suited to large areas, it is laid in squares of varying size, the tiles being cemented edge to edge when laid, as well as to the sub-floor. A veining effect resembling marble runs through the material, and the tiling is made up in some fifteen distinct color combinations.

Usco flooring, another type, is made from two special rubber compounds, and displays a variety of designs and color combinations. It is easily installed over stone, metal, concrete or wood, and is especially adapted for small landings. The top layer of this flooring, presenting a durable surface, is made of a tough rubber compound, while the lower or foundation layer is of comparatively soft and springy stock, which gives a cushion effect and will not stretch or warp. Vulcanization unites both layers into a solid and seamless sheet.

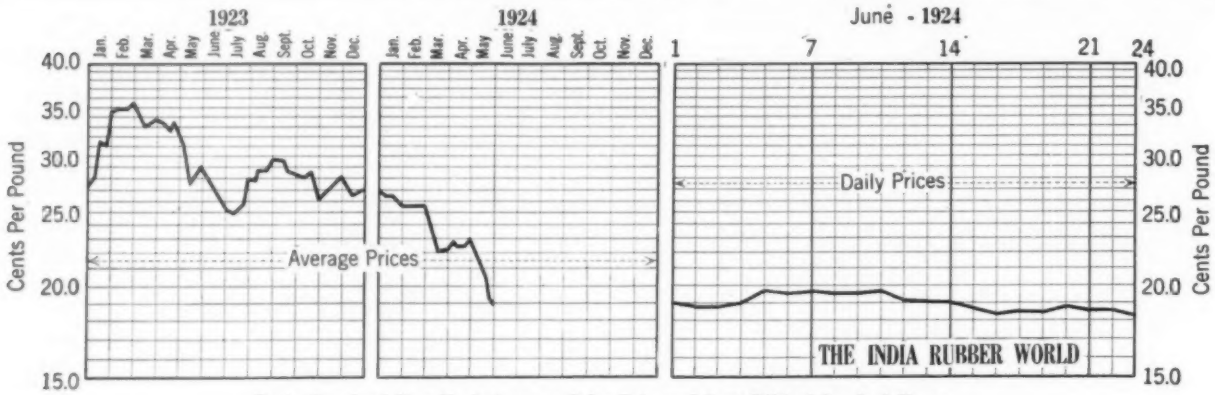
In addition to these types of tiling and floor covering the company manufactures Usco sheet rubber stair treads, "U. S." Motomats for automobile running boards, Diamond-Cell door mats, "U. S." metal inserted matting, as well as other corrugated and perforated varieties suited for every possible use.

April Tire Exports Improve

American exports of pneumatic tires showed during April a decided increase, corresponding to the improvement evidenced in shipment values since the first of the year, these being $866,651 for January; February, $1,043,452; March, $1,154,201; and April, $1,402,594.

Foreign competition, however, has been making itself felt in recent months, as shown by the fact that total export shipments of such goods from January to April inclusive, of the present year, at $4,466,898, compare very unfavorably with figures for the corresponding months of 1923, or $6,642,652. England, heretofore America's best customer for tires, imported this year from the United States during the four months in question pneumatic tires valued at only $552,239, as compared with $1,413,204 for the 1923 period. Other countries also showing comparative declines were: Argentina, from $525,669 in the four months of 1923 to $333,176 in 1924; New Zealand, $465,379 to $167,372; Australia, $329,287 to $214,289; Canada, $295,982 to $232,474; and Sweden, $244,068 to $189,662.

Japan, however, advanced during this four months period from $194,734 in 1923 to $379,577 in 1924, while little change appears in the totals for Mexico and Cuba. It is encouraging to note also the following, perhaps seasonal, increases in these tire exports to the following countries during April, 1924: Sweden, taking goods valued at $126,855, as compared with $29,833 in the month preceding; Australia, $119,355 as against $33,658; and Mexico, $147,488 as against $56,378. The reduction of excise taxes from 5 to 2½ per cent, the increasing possibilities of limitation of tire warranties, and the prospects for balloon tire production are all causes of encouragement to the industry following its recent depression.



Ratio Graph of New York Average Sales Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE MARKET conditions prevailing between May 24 and June 24 were characteristic of the customary summer dullness, moderate spot buying interest, with all factors looking for developments in the near future leading to better demand and prices.

A persistent downward trend was in evidence most of the month, due to lack of consuming demand, by which spot rib prices were depressed from 19½ cents to 18⅜ cents during the interval mentioned. Spot first latex crêpe was scarce and maintained a premium over ribbed smoked sheets of ½ cent to 1⅝ cents a pound.

Early in June a shortage of ribs developed because of the general policy of factory buying from hand to mouth in frequent small spot lots, which temporarily depleted spot stocks, and because of the delay till June of ships scheduled to land rubber in New York in May. The same condition may again occur this fall if sudden renewal of the limited factory inventories of rubber takes place and shipments from the Far East should decrease materially.

An important factor depressing the market is the large stock of unsold finished tires in manufacturers' and dealers' hands. The recently announced tire price reduction of 10 to 15 per cent by heaviest producers was made to stimulate sales of balloon tires to automobilists. It will also help to move the excess stock of high pressure tires into service and renew manufacturers' interest in crude rubber supplies.

At present there is no general interest of factories in future positions which run only fractionally above those for spot grades.

Parás were steady and in rather short supply on spot.

Balatas have been firmer, due to prevalence of drought in northern South American producing areas.

Importations of all grades during May, 1924, were 23,914 tons, compared with 36,184½ tons one year ago. Plantation arrivals for May, 1924, were 22,466 tons, compared with 34,609 tons one year ago. Total importations of all grades for the five months ended May 31, were 137,476 tons, compared with 157,105½ tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. June 2. Spot first latex crêpe, 19⅝-19¾ cents; June-July, 19¾-19⅞ cents; July-Sept., 19⅞-20 cents; Oct.-Dec., 20-20¼ cents.

June 24. Spot first latex crêpe, 19⅛ cents; July, 19¼ cents; July-Sept., 19⅝ cents; Oct.-Dec., 20 cents.

June 2. Spot ribbed smoked sheets, 18¾-19 cents; June-July, 19⅛-19¼ cents; July-Sept., 19¼-19⅜ cents; Oct.-Dec., 19⅝-19¾ cents.

June 24. Spot ribbed smoked sheets, 18-18¼ cents; July, 18 cents; July-Sept., 18¼ cents; Oct.-Dec., 18¾ cents.

June 2. Spot No. 2 amber crêpe, 18⅝-18¾ cents; June-July, 18⅝-18¾ cents; July-Sept., 18¾-19 cents; Oct.-Dec., 19-19¼ cents.

June 24. Spot No. 2 amber crêpe, 17⅞ cents; July, 18 cents; July-Sept., 18½ cents; Oct.-Dec., 18½ cents.

June 2. Spot No. 1 rolled brown crêpe, 17½-17⅝ cents; June-July, 17½-17⅝ cents; July-Sept., 17⅝-17¾ cents; Oct.-Dec., 17¾-18 cents.

June 24. Spot No. 1 rolled brown crêpe, 16½ cents; July, 16½ cents; July-Sept., 16⅞ cents; Oct.-Dec., 17 cents.

SOUTH AMERICAN PARAS AND CAUCHO. June 2. Spot, up-river fine, 20-21½ cents; island fine, 18 cents; upriver coarse, 13⅞-14 cents; island coarse, 11¼-11½ cents; Cametá, 10½ cents; caucho ball, 13¼ cents.

June 24. Spot, upriver fine, 20 cents; islands fine, 19 cents; upriver coarse, 12¾ cents; Cametá, 11 cents; caucho ball, 12½-13 cents.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS	May, 1924																	June, 1924					
	12	13	14	15	16	17	19	20	21	22	23	24	26	27	28	29	30*	31	2	3	4	5	6	7
Sheet																								
Ribbed smoked	20⅞	20⅜	19⅞	20	19	18	17⅝	18	18⅜	18⅜	19	19⅛	18⅞	18⅞	18⅞	18¾	....	18¾	18⅞	19⅛	19⅝	19⅜	19½	19⅛
Crêpe																								
First latex	21¾	21½	20⅝	20½	19½	18⅝	18⅛	18⅝	19	19⅛	19¼	19⅜	19½	19⅝	19⅝	19¾	....	19¾	19¾	19⅞	20½	20¼	20½	20⅛
Off latex	21⅜	20¾	20⅛	20¼	19	18¼	17⅜	18⅜	18¾	18½	19½	19½	19⅛	19⅜	19⅜	19⅜	....	19⅜	19¼	19½	19⅞	19⅝	20	20
No. 1 blanket	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18¾	18⅞	18¾	18⅞	18⅞	19
No. 2 blanket	20¼	19⅝	19⅜	19⅝	18¼	17½	17	17¼	17½	17¾	18	18¼	18	18¼	18¾	18¼	....	18¼	18¼	18⅜	18½	18⅝	18¾	18¾
No. 3 blanket	20	19⅛	19⅛	18⅞	18	17¼	16¾	17	17⅛	17½	17⅜	18	17¾	17⅞	18⅛	18	....	18	18	17⅞	18¼	18⅜	18⅜	18⅜
Thin, clean brown	20⅛	19¾	19⅛	19½	18½	17½	17⅛	17⅜	17½	17⅝	18⅛	18⅛	17¾	17¾	18	17¼	....	17⅞	17⅞	18¼	18½	18½	18½	18½
Specky brown	20	19¼	19⅛	19	17¾	17	16¾	17	17⅛	17¼	17⅝	17⅞	17½	17½	17⅜	17½	....	17½	17⅜	17¾	17⅞	18	18⅛	18
Rolled brown	19½	18⅝	18½	18⅜	17⅜	16⅞	16⅜	16⅞	17	17	17½	17¾	17¼	17⅜	17⅜	17½	....	17½	17⅜	17¼	17⅜	17½	17⅜	17⅜

* Holiday.

New York Quotations

Following are the New York spot rubber quotations, for one year, one month ago, and June 24, the current date:

Plantation Hevea	June 25, 1923	May 24, 1924	June 24, 1924
LATEX			
Rubber latex (Hevea)..*gal.*	$1.25 @$1.30	$1.25 @	$1.25 @
CREPE			
First latex	.26 @	.19¾ @.20	.19⅛ @
Off latex	.25¾ @	.19 @	.18½ @
Amber No. 1	.25⅛ @	@	@
Amber No. 2	.24⅞ @	.18¾ @	.17¾ @.18
Amber No. 3	.24⅜ @	.18⅛ @	.17⅛ @.17¾
Brown, clean, thin	.24½ @	.18⅛ @	.17¾ @
Brown, specky	.24¼ @	.18 @	.17 @
Brown, roll	.24 @	.17¾ @.18	.16½ @.17
Sole crêpe	@	.45 @.48	.45 @
SHEET			
Smoked, ribbed	.26 @	.19¼ @.19¾	.18 @.18¼
Smoked, plain	.25½ @	@	@
Unsmoked	.25 @	@	@
East Indian			
PONTIANAK			
Banjermassin	.07 @.08	@	.06 @.07¼
Palembang	.08 @.10	@	.07½ @
Pressed block	.12 @.13	@	.12 @.15
Sarawak	.07 @.09	.06¾ @	.06¾ @
South American			
PARAS			
Upriver, fine	.27 @.27¼	.19 @.19½	.20 @
Upriver, fine	*.38½ @	*.25¼ @	*.26½ @
Upriver, medium	.24 @	.17½ @.18	.17½ @.18
Upriver, coarse	.23¾ @.24	.13¼ @.13¾	.12¾ @.13
Upriver, coarse	*.37 @	*.22½ @	*.23½ @.24½
Islands, fine	.25 @.25½	.18 @	.19 @
Islands, medium	.23½ @	.16 @	.17 @
Islands, coarse	.14 @	.11¼ @	.11¼ @.11½
Cametá	.14 @	.11½ @	.11 @
Acre Bolivian, fine	.27 @	.19½ @	.20¾ @
Acre Bolivian, fine	*.39 @	*.25½ @	*.27 @
Beni Bolivian	.27½ @.28	.20 @	.21½ @
Madeira, fine	.27 @	.21 @	.22 @
Peruvian, fine	.25½ @.26	.18 @.18½	.19 @
Tapajos, fine	.26 @	.18 @.18½	.18½ @.19
CAUCHO			
Upper caucho ball	.25 @	.13 @.13¾	.12¾ @.13½
Upper caucho ball	*.38 @	*.22½ @	*.22 @.24
Lower caucho ball	.24 @	.12 @.12¾	.12 @.12½
Maniçobas			
Ceará negro heads	.22 @	.19 @	.19 @
Ceará scrap	.09 @	.08 @	.18 @
Maniçoba 30% guaranty	.21 @	.16 @	.16 @
Mangabeira, thin sheet	.22 @	.20 @	.20 @
Centrals			
Central scrap	.17½ @.18	@	.13½ @
Central wet sheet	.12 @.14	@	.09 @
Corinto scrap	.17½ @.18	@	.13½ @
Esmeralda sausage	.17½ @.18	@	.13½ @
Guayule washed and dried	.28 @	.23 @	.22 @
Africans			
Benguela, No. 1, 28½%..	.18 @	@	@
Benguela, No. 2, 32½%..	.15 @	†.12 @	†.11 @
Congo prime, black upper	.23 @	†.17 @	†.16 @.17
Congo prime, red upper	.22 @	†.18 @	†.15 @.16
Kassai, black	.23 @	†.17 @	†.16 @.17
Kassai, red	.22 @	†.19 @	†.15 @.16
Gutta Percha			
Gutta Siak	.16 @.18	.16¼ @	.16 @
Gutta Sch	@	.28 @	.28½ @
Red Macassar	3.00 @3.05	3.00 @	2.90 @3.00
Balata			
Block, Ciudad Bolivar	.63 @.66	.62 @	.65 @
Colombia	.52 @.54	.53 @	.54 @
Panama	.50 @.52	.53 @	.54 @
Surinam, sheet	.80 @.84	.70 @	.75½ @
amber	.76 @.78	.74 @	.78 @
Chicle			
Honduras	.62 @	‡.58 @.68	‡.58 @.68
Yucatan, fine	.65 @	‡.58 @.68	‡.58 @.68

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.
‡Duty paid.

London

The London crude rubber market was generally dull, weak and declining the entire month. There was a lull in American buying interest and prices receded somewhat, due to announcement of tire price reductions by leading American companies.

The monthly average price of first grade plantation rubber was 10½ pence a pound. Attention is directed to the fact that under the terms of the Restriction Enactment if the price averages under one shilling for the quarterly period ending July 31 the exportable allowance from Malaya and Ceylon at the minimum rate of duty will be reduced from 60 to 55 per cent. A further reduction of five per cent a quarter will automatically take place until an average of 1*s.* 6*d.* or over is reached over a full quarterly period. It will be seen that the possibility of a substantial curtailment at the end of the current quarter is by no means remote. This factor, in conjunction with the reduction in stocks now in progress, should have an important bearing on the trend of the market. Also, it will strengthen the scheme of cooperative selling now being prepared by the Rubber Growers' Association.

Reported London stocks decreased 1,980 tons between May 20 and June 24. The weekly stocks were as follows: May 27, 52,289 tons; June 3, 51,479 tons; June 10, 51,096 tons; June 17, 50,799 tons; June 24, 51,065 tons.

Comparative Low and High New York Spot Rubber Prices

	June 1924*	June 1923	June 1922
PLANTATIONS			
First latex crêpe	$0.19⅛ @$0.21	$0.25½ @$0.29½	$0.14¾ @$0.15¼
Smoked sheet, ribbed	.18⅛ @ .19¼	.25½ @ .29½	.14⅝ @ .15¼
PARAS			
Upriver, fine	.20 @ .21½	.26¼ @ .29	.18 @ .18
Upriver, coarse	.13½ @ .14	.23⅜ @ .25	.12¼ @ .13
Islands, fine	.18 @ .19	.25¼ @ .27¼	.16⅞ @ .17½
Islands, coarse	.11¼ @ .11½	.16 @ .17	.07¾ @ .13
Cametá	.10½ @ .11	.13¼ @ .14¼	.08 @ .09½

* Figured to June 21, 1924.

Reclaimed Rubber

The general slacking down of activity in virtually all manufacturing branches of the rubber industry has been reflected in marked falling off of the demand for reclaims. Prices at which the various grades are offered remain at substantially rock bottom. Three readjustments only are noted and these are downward revisions.

Reclaiming plants generally are operating on two to three days a week. If any are running at half capacity they are building up stocks anticipatory to revival of demand.

Reclaimers are unable by closest calculations to show a profit. They are either breaking even or running into red figures.

Taking scrap at present costs, which are the lowest, the figures on cost of manufacturing and selling reclaims reveal that inflated labor charges are absorbing the margin of profit. Labor is the only item not yet proportionably deflated although it has been reduced somewhat from war time levels.

New York Quotations

June 24, 1924

Auto Tire		
Black	*lb.*	$0.08½ @$0.08¾
Black, washed	*lb.*	.10 @ .10½
Dark gray	*lb.*	.09½ @ .09¾
Light gray	*lb.*	.11 @ .11¼
White	*lb.*	.13¼ @ .13¾
Shoe		
Unwashed	*lb.*	.08½ @ .09
Washed	*lb.*	.12 @ .12½

Reclaimed Rubber—*Continued*

Tube

No. 1	lb.	.14 @ .14¼
No. 2	lb.	.10½ @ .10¾

Uncured Tire Friction

No. 1	lb.	.18½ @ .19
No. 2	lb.	.14 @ .15

Miscellaneous

High grade, red	lb.	$0.13 @$0.13¼
High tensile, black	lb.	.13 @ .13¾
Mechanical blends	lb.	.05 @ .06
Truck tire	lb.	.07¼ @ .08

The Market for Rubber Scrap

The market during June was stagnant as to demand for stocks by consumers who were totally without interest and operating at virtually minimum capacity. The outlook indicates that revival of interest in scrap will be delayed for some months. At present scrap dealers are only mildly active in purchasing boots and shoes, mixed tires and inner tubes for warehousing. Prices are now so low on all grades of rubber scrap that they cannot go lower without eliminating every vestige of margin for collector and dealer.

BOOTS AND SHOES. In the East business has been at a standstill and not much better in the West.

INNER TUBES. Tube scrap has been but slightly more active than other divisions. A little foreign business continues on very low bids.

MIXED TIRES. Domestic business is stagnant. There has been no export business worth mention. Some houses are reported as having made shipments to Spain of tires cut in sections.

Consumers' Quotations for Carload Lots Delivered

June 24, 1924

Boots and Shoes

Boots and shoes, black	lb.	$0.02¼ @$0.02½
Trimmed arctics	lb.	.01½ @ .01¾
Untrimmed arctics	lb.	.01 @ .01¼

Hard Rubber

Battery jars, black compound	lb.	.01 @ .01¼
No. 1 scrap	lb.	.05 @ .06

Inner Tubes

No. 1	lb.	.03½ @ .03¾
No. 2	lb.	.02½ @ .02¾
Red	lb.	.02¾ @ .02⅞

Mechanicals

Black scrap, mixed	lb.	.00¾ @ —
Heels	lb.	.00½ @ —
Horse-shoe pads	lb.	.01 @ —
Hose, air brake	ton	13.00 @15.00
regular	ton	10.00 @12.00
Red, scrap, mixed	lb.	.01½ @ .01¾
White, scrap, mixed	lb.	.01½ @ .01¾

Tires

PNEUMATIC

Auto peelings	lb.	.01 @ .01¼
Bicycle	ton	10.00 @12.00
Standard white autos, with beads	ton	25.00 @28.00
Mixed autos, with beads	ton	11.00 @12.00
Stripped, unguaranteed, with beads	ton	10.00 @10.50

SOLID

Carriage	ton	20.00 @22.00
Irony	ton	10.00 @13.00
Truck, clean	ton	19.00 @21.00

WHILE ENGLAND, FRANCE, AND JAPAN, THE LEADING PURCHASERS of American-made rubber thread, bought less of this commodity in 1923 than in the year previous, Italy's importation advanced from a value of $44,619 in 1922 to $55,724 in 1923. Other occasional purchasers of rubber thread were Belgium, Quebec and Ontario, Switzerland, Spain, China, Brazil, Argentina, Chile, Peru, and British South Africa.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	April, 1923		April, 1924	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	178,680	$58,517	153,649	$33,189
Netherlands	1,486,748	432,990	76,767	14,093
Portugal	.....	.....	.....	.....
United Kingdom	11,896,258	4,268,382	3,747,370	907,739
Canada	.....	.....	56,716	13,215
Central America	17,228	3,235	1,938	279
Mexico	56,000	11,200	178,408	31,904
Brazil	2,294,246	500,206	2,200,698	328,925
Peru	74,640	24,881	122,617	31,583
Other So. America	327,505	82,017	433,733	84,793
British E. Indies	41,949,105	13,210,336	62,410,059	15,014,791
Dutch E. Indies	9,717,255	2,938,965	15,391,162	4,005,983
Other countries	1,582,349	395,085	269,864	65,327
Totals	69,580,014	$21,925,814	85,042,981	$20,531,821
Balata	108,095	56,932	44,462	25,604
Jelutong (Pontianak)	1,385,595	92,503	1,580,963	166,689
Gutta percha	107,682	17,804	20,758	8,803
Gunyule	.....	.....	108,600	19,234
Rubber scrap	2,233,778	91,559	1,434,410	64,318
Totals	73,415,164	$22,184,612	88,232,174	$20,816,469
Chicle—*dutiable*	709,543	321,062	1,026,754	507,738
MANUFACTURED—*dutiable*				
Rubber belting	72,801	$53,336	61,822	$49,177
Other manufactures of substitutes for rubber	.....	64,193	.....	238,119
Totals	72,801	$117,529	61,822	$287,296

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	542,093	$49,772	505,535	$44,065
Scrap and old	1,501,153	65,662	2,229,344	86,417
Footwear				
Boots—*pairs*	23,340	73,742	23,055	67,505
Shoes—*pairs*	49,172	50,293	53,300	42,261
Canvas shoes with rubber soles—*pairs*	465,198	333,521	243,427	196,322
Druggists' rubber sundries	74,644	67,983	.....	.....
Water bottles and fountain syringes—*number*	.....	.....	11,427	9,556
Other druggists' rubber sundries	.....	.....	52,660	67,096
Bathing caps—*dozen*	.....	.....	20,441	33,923
Hard rubber goods				
Battery jars and accessories	86,506	21,735	13,855	5,238
Other electrical supplies	24,144	11,147	12,322	9,077
Other hard rubber goods	66,782	48,619	46,668	54,726
Tires				
Pneumatic casings				
For automobiles—*number*	166,865	1,714,702	113,135	1,402,594
Others—*number*	4,937	18,986	3,665	14,431
Pneumatic tubes				
For automobiles—*number*	118,996	185,581	90,896	182,767
Others	4,651	4,695	2,780	2,240
Solid tires				
For automobiles and motor trucks—*number*	7,520	184,926	8,068	209,520
Others	79,646	20,351	134,840	33,368
Tire repair materials	72,516	28,635	116,523	41,858
Belting	230,305	133,234	342,331	212,174
Hose	319,201	124,068	446,767	166,097
Packing	139,508	62,847	195,909	83,561
Soles and heels	169,282	60,945	235,891	72,068
Thread	130,295	127,578	87,573	84,761
Other rubber manufactures	639,240	312,538	418,324	213,485
Totals	.....	$3,701,560	.....	$3,335,110

Exports of Foreign Merchandise

UNMANUFACTURED				
Crude rubber	1,713,627	$536,358	1,800,945	$434,368
Balata	22,496	7,300	4,894	3,015
Jelutong (Pontianak)	.....	.....	.....	.....
Chicle	57,681	20,765	.....	.....
Gutta percha and rubber substitutes and scrap	.....	.....	.....	.....
Totals	1,803,804	$564,423	1,805,839	$437,383
MANUFACTURED				
Gutta percha and india rubber	292	260	13,697	7,222
Totals	292	$260	13,697	$7,222

Details of exports of domestic merchandise by countries during April, 1924, appear on pages 704-707 of this issue.

The Market for Chemicals and Compounding Ingredients

New York

IN ALL lines of compounding ingredients rubber manufacturers are taking supplies in a closely restricted routine way. This policy reacts favorably on those ingredients that show the best volume cost combined with specific technical quality. Business in ingredients that so qualify is doing well in the present situation where competition is increasingly dominant.

ACCELERATORS. Manufacturers of organic accelerators particularly are engaged in a steady campaign of education covering general and special applications of their materials to manufacturing problems. The use of super-accelerators for the economy of both time and steam is gaining favor as a factor in competition, special efforts now being directed to the field of dry heat curing. There seems to be only one method of cure in which accelerators are not needed; that is the acid cure, in which curing has naturally all the speed required.

CARBON BLACK. The demand for carbon black is very good, having fallen off somewhat due to the general movement to restrict the making of tires. However, there is a gratifying extension of the use of carbon black into many mechanical rubber goods, boots and shoes, and other lines where its assistance in promoting abrasive wear is being more fully realized.

The price situation is firm, the advance in May being well maintained. Threatened curtailment of carbon black production by legislative authority has not yet become effective. In this regard proceedings are now in the phase of public hearing.

FILLERS. The usual inert fillers are in moderate movement. The use of clay is gaining because its intrinsic technical value and low volume cost give it an advantage over some of the standard fillers. The production of rubber compounding clay is comfortably equal to the current demand, whereas some months ago it was several weeks in arrears of orders.

LEAD PIGMENTS. Consumption of litharge and sublimed lead has fallen off and is not better than routine. Active resumption of dry heat goods, such as boots and shoes, topping weather proofing, etc. will aid the demand. A general reduction in lead pigment prices became effective last month. These declines were a direct result of reduced prices for pig lead. In the case of litharge the reduction is ½ cent a pound.

ZINC OXIDE. Business is holding up fairly well, according to producers' reports, and the price basis continues unaltered. Tire makers have adjusted their purchases and takings on contract strictly to their current needs.

New York Quotations

June 24, 1924

Accelerators, Inorganic

Lead, carbonate	lb.	$ .09¼	@
Lead, red	lb.	.10½	@
sublimed blue	lb.	.09¼	@
sublimed white	lb.	.09¼	@
Lime, flour	lb.	.02½	@
R. M.	lb.	.01¼	@ .01½
R. M. hydrated	ton	25.00	@
superfine	lb.	.01½	@ .02
Litharge, domestic	lb.	.10	@ .12
imported	lb.	*.17	@
Magnesia, carbonate, light	lb.	.07½	@ .09
calcined, light (bbls.)	lb.	.24	@ .25
calcined, ex. light (bbls.)	lb.	.40	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.04½	@ .06
Orange mineral A.A.A.	lb.	.13½	@
Rubber lead	lb.	.10	@

Accelerators, Organic

A-7	lb.	.75	@ .85
A-19	lb.	.85	@ .95
Accelemal	lb.	.28	@
Accelerene (f. o. b. English port)	lb.	13s.	@
Aldehyde ammonia powder	lb.	.95	@
Aniline (f. o. b. factory)	lb.	.16½	@ .17½
sulphate	lb.	.33	@
Cryline	lb.	.60	@
Diphenylguanidine	lb.	1.10	@ 1.15
Ethylidene aniline	lb.	.70	@ .75
Excellerex	lb.	.35	@ .40
Formaldehyde aniline	lb.	.42½	@
Hexamethylene tetramine	lb.	.85	@
Lead oleate (bbls.)	lb.	.15	@
Methylene aniline	lb.	.38	@ .44
No. 999	lb.	.15½	@
Paraldehyde	lb.	.17	@ .19
Paraphenylene diamine	lb.	1.40	@ 1.50
Super-sulphur, No. 1	lb.	$0.50	@ $0.60
No. 2	lb.	.25	@ .35
Tuads (Tetramethyl thiuram-disulphide)	lb.	6.00	@
Thiocarbanilide	lb.	.26	@ .32
Triphenylguanidine	lb.	.75	@

*Nominal.

Acids

Acetic 28% (bbls.)	cwt.	3.38	@
glacial (carboys)	lb.	.16	@
Creaylic (95% straw color)	gal.	.63	@ .70
(95 dark)	gal.	.61	@ .68
Sulphuric, 66 degrees	lb.	.02	@

Alkalies

Caustic soda	cwt.	3.10	@ 3.86
flake, 76% (factory)	cwt.	3.60	@ 3.85
solid, 76% (factory)	cwt.	3.10	@

Colors

BLACK

Aerofloted arrow	lb.	.09½	@ .14
Bone	lb.	.05½	@ .07½
Carbon black	lb.	.08½	@ .12
compressed	lb.	.09	@ .12
Drop	lb.	.06	@ .10
Ivory black	lb.	.12	@ .30
Lampblack	lb.	.11	@ .40
Micronex	lb.	.09	@ .14
A. & W. Nonfli	lb.	.40	@
Shawinigan	lb.	.15	@ .16

BLUE

Cobalt	lb.	.21	@ .26
Gritless blue	lb.	2.00	@ 4.00
Prussian	lb.	.55	@ .60
Ultramarine	lb.	.15	@ .35

BROWN

Iron oxide	lb.	.04½	@ .05½
Sienna, Italian	lb.	.05½	@ .06½
Umber, Turkey	lb.	.05	@ .06½

GREEN

Chrome, light	lb.	$0.30	@ $0.31
medium	lb.	.32	@ .35
dark	lb.	.35	@ .38
commercial	lb.	.10½	@ .11½
tile	lb.	.13	@ .15
Gritless green	lb.	2.00	@ 3.00
Oxide of chromium	lb.	.36	@ .55
T. K.	lb.	.40	@ .45

RED

Antimony, golden	lb.	.20	@ .22
golden T. K.	lb.	.18	@ .20
golden R.M.P. No. 7	lb.	.20	@
golden, 15/17% G. E.	lb.	.20	@ .22
golden, 15/17% F. S.	lb.	.18	@
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.20	@
Antimony, crimson	lb.	.40	@ .42
crimson T. K.	lb.	.45	@ .50
crimson, 15/17% G. E.	lb.	.40	@ .45
crimson, 15/17% F. S.	lb.	.37	@
crimson, R.M.P. No. 3	lb.	.45	@
crimson F.	lb.	.45	@
7-A	lb.	.35	@
Z-2	lb.	.18	@
Golden pentasulphide T. K.	lb.	.32	@ .35
Vermilion, 5% F. S.	lb.	.65	@
Vermilion 15/17% F.S.	lb.	.50	@
Arsenic-sulphide, red	lb.	.14¼	@
Gritless red (four shades)	lb.	1.50	@ 3.00
purple	lb.	2.00	@ 3.00
Indian maroon, English	lb.	.11	@
Iron oxide, domestic	lb.	.08	@ .12
English	lb.	.12	@ .14
Indian	lb.	.08	@ .12
pure bright	lb.	.12	@ .14
reduced	lb.	.08	@ .10
Spanish	lb.	.02¾	@ .04½
Venetian	lb.	.02¾	@ .06
Oximony	lb.	.16	@
Pará toner	lb.	.95	@ 1.00
Toluidine toner	lb.	2.20	@ 2.75
Vermilion, English	lb.	1.35	@ 1.50

Colors—*Continued*

WHITE

Akcolith ..... lb.		@	
Albalith ..... lb.	.06⅞	@	.07⅛
Aluminum bronze ..... lb.	.55	@	1.25
Lithopone ..... lb.	.06½	@	
Sterling ..... lb.	.06¾	@	.07
Azo ..... lb.	.06⅞	@	.06¾
Imported ..... lb.	.06	@	.07
Red seal, imported ..... lb.	.13	@	.13½
T. O. Pigment ..... lb.	.07	@	.07¼
Zinc oxide:			
AAA, lead free ..... lb.	.08	@	.08¼
Azo (factory):			
ZZZ (lead free) ..... lb.	.08	@	.08¼
ZZ (—5% leaded) .. lb.	.07⅛	@	.07⅜
Z (8.10% leaded) .... lb.	.07⅛	@	.07⅜
French process, Florence brand			
Green seal ..... lb.	.11	@	.11¼
Red seal ..... lb.	.10	@	.10¼
U. S. P. ..... lb.	.16	@	.18
White seal ..... lb.	.12	@	.12¼
Horse Head brands			
Selected ..... lb.	.08⅜	@	.08⅜
Special ..... lb.	.08⅜	@	.08⅜
XX red ..... lb.	.08⅜	@	.08¾
Leaded brands			
Lehigh ..... lb.	.07¼	@	.07½
Standard ..... lb.	.07¼	@	.07½
Sterling ..... lb	.07¼	@	.07½
Superior ..... lb.	.07¼	@	.07½
Palmerton process			
Kadox, black ..... lb.	.12	@	.12¼
blue ..... lb.	.11	@	.11¼
red ..... lb.	.10	@	.10¼
Snow white ..... lb.	.12	@	

YELLOW

Arsenic ..... lb.	.75	@	
Chrome ..... lb	.21	@	
Gritless yellow ..... lb.	2.50	@	4.00
India rubber ..... lb.	.75	@	
Ochre, domestic ..... lb.	.01½	@	.02
imported ..... lb.	.03	@	.03½

Compounding Ingredients

Aluminum flake (carloads) ton	29.00	@	
filler ..... ton	23.00	@	
hydrate, light ..... lb.	.17	@	.18
Ammonia carbonate ..... lb.	.13	@	.14½
Asbestine ..... ton	13.00	@	25.00
Aluminum silicate ..... ton	22.50	@	25.00
Barium, carbonate ..... ton	68.00	@	70.00
dust ..... lb.	.05	@	.06
Barytes, imported ..... ton	28.00	@	33.00
pure white ..... ton	23.90	@	
O.C.X., off color ..... ton	15.00	@	
uniform floated ..... ton	23.90	@	
water ground and floated ton	23.00	@	26.00
Basofor ..... lb.	.04¼	@	
Blanc fixe ..... lb.	.04	@	.04¼
Carrara filler (factory) .... lb.	.01¾	@	
Chalk, precip. extra light ... lb.	.04½	@	.05
heavy (f.o.b. factory) .... lb.	.03¼	@	.04
Clay, Dixie ..... ton	22.00	@	35.00
Blue ribbon (carloads) .. ton	14.00	@	
Blue Ridge ..... ton	12.00	@	26.00
Catalpo ..... ton	40.00	@	
China ..... lb.	.01½	@	
China, L. H. B. ..... lb.	14.00	@	25.00
English, L. H. B. ..... lb.	.02½	@	
Langley ..... ton	18.00	@	
Cotton flock, black ..... lb.	.12	@	
light-colored ..... lb.	.12	@	.13½
white ..... lb.	.14½	@	.23
Cotton linters clean mill-run lb.	.05¾	@	
Fossil flour (powdered) ... ton	60.00	@	
(bolted) ..... ton	60.00	@	

* Nominal.

Chemical Market—*Continued*

New York Quotations

June 24, 1924

Glue, high grade ..... lb.	$0.22	@	$0.30
medium ..... lb.	.20	@	.26
low grade ..... lb.	.15	@	.18
Graphite, flake ..... lb.	.06½	@	.12
Infusorial earth (powd.) ... ton	60.00	@	
(bolted) ..... ton	65.00	@	
Lime (bolted) ..... lb.	.01½	@	
Mica, amber ..... lb.	.05	@	
powdered ..... lb.	*.15	@	
white ..... lb.	.06	@	
Pumice stone, powdered .... lb.	.03	@	.05
Rotten st., powd. (bbls.) ... lb.	.02½	@	.04½
Slate flour (factory) ..... ton	8.50	@	15.00
Soap bark, cut ..... lb.	.09¼	@	.09¾
Soapstone, powdered, gray. ton	12.00	@	22.00
Sodium bicarbonate (bbls.). lb.	.02½	@	.02¾
Starch, powd. corn (bags). cwt.	3.17	@	3.27
(bbls.). cwt.	3.44	@	3.54
Talc, soapstone ..... ton	15.00	@	22.00
Terra blanche ..... ton	23.00	@	25.00
Whiting, domestic ..... ton	12.50	@	
chalk ..... ton	16.50	@	25.00
commercial ..... ton	10.00	@	
English, cliffstone .... cwt.	1.50	@	1.75
Georgia calcite ..... ton	12.00	@	
gilders (bolted) ..... cwt.	1.10	@	1.20
K. T. ..... ton		@	
Perfection ..... ton	13.50	@	17.00
Quaker ..... ton	13.00	@	22.00
Snowflake white ..... ton	15.00	@	
Superfine ..... ton	12.50	@	22.50
Sussex ..... ton	8.00	@	16.00
Witco ..... ton	20.00	@	
York ..... ton	8.00	@	
Wood pulp, XXX ..... ton	35.00	@	
X (f. o. b. factory) .... ton	25.00	@	

Mineral Rubber

Genasco (factory) ..... ton	50.00	@	52.00
Gilsonite ..... ton	65.00	@	
Granulated M. R. ..... ton	40.00	@	60.00
Hard hydrocarbon ..... ton	31.00	@	50.00
Liquid rubber ..... lb.	.10	@	
Ohmlac Kapak, K-R ..... ton	50.00	@	65.00
K-4 ..... ton	175.00	@	
Soft hydrocarbon ..... ton	30.00	@	50.00
320/340 M. P. hydrocarbon. ton	45.00	@	50.00
300/310 M. P. hydrocarbon. ton	40.00	@	45.00
Pioneer, M. R., solid (fac.). ton	42.00	@	44.00
M. R. granular ..... ton	52.00	@	54.00
Robertson, M. R., solid .... ton	35.00	@	75.00
M. R. granular (factory) ton	42.00	@	80.00
Rubrax (factory) ..... ton	60.00	@	
Synpro, gran. M. R. (fac.). ton	55.00	@	

Resins and Pitches

Tar, pine, retort ..... bbl.	11.50	@	
kiln ..... bbl.	11.50	@	
Pitch, Burgundy ..... lb.	.05	@	
coal tar ..... bbl.	8.00	@	
Fluxol hardwood ..... lb.	.02	@	.04
pine tar ..... bbl.	6.50	@	
ponto ..... lb.	.05	@	
Rosin, K (bbl.) ..... 280 lbs.	6.55	@	
strained (bbl.) .... 280 lbs.	6.40	@	
Shellac, fine orange ..... lb.	.75	@	*.90
substitute ..... gal.	1.50	@	

Softeners

Avoilas compound ..... lb.	.13	@	.15
Castor, No. 1, U. S. P. .... lb.	.16	@	
No. 3, U. S. P. ..... lb.	.15½	@	
Corn, crude (bbls.) ..... lb.	.10½	@	
Cotton, Summer yellow ..... lb.	.10½	@	
Cycline ..... gal.	.35	@	.38
Glycerine ..... lb.	.16½	@	.17
Linseed, raw ..... gal.	.94	@	
Palm lagos ..... lb.	.07⅛	@	
oil clarified ..... lb.	.09½	@	.10
Palm, niger ..... lb.	.06¾	@	
Parra M. R. flux ..... lb.	.06	@	.07
Peanut, crude ..... lb.	.10	@	
refined ..... lb.	.16	@	.16
Petrolatum, standard ..... lb.	.06	@	.08
Petrolatum, sticky ..... lb.	.08	@	.10
Pine, steam distilled ..... gal.	.72	@	
Rapeseed, refined ..... gal.	.80	@	
blown ..... gal.	.94	@	
Rosin ..... gal.	.44	@	
Synpro ..... gal.		@	
Soya bean ..... lb.	.12¼	@	.12½
Tar ..... gal.	.26	@	
Woburn ..... lb.	.05	@	

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.]) ..... lb.	.25	@	.25½
Benzol (90% drums [7.21 lbs. per gal.]) ..... gal.	.26	@	.31
pure (drums) ..... lb.		@	
Carbon bisulphide (dms. [10.81 lbs. per gal.]) ..... lb.	.06½	@	.07½
tetrachloride (drums, [13.28 lbs. per gal.]) ..... lb.	.08	@	.08½
Gasolene			
No. 303			
Tankcars ..... gal.	.21	@	
Drums, carlots ..... gal.	.24	@	
Drums, less carlots ..... gal.	.27	@	
Motor gasoline (steel bbls.) ..... gal.	.20	@	
Naphtha, V. M. & P. .... gal.	.19	@	
solvent (drums extra) .. gal.	.35	@	
68° Bé., 122°, 324° ... gal.	.16½	@	
70° Bé., 114°, 314° ... gal.	.17½	@	
71° Bé., 112°, 304° ... gal.	.18½	@	
Cymene (factory) ..... gal.	2.00	@	2.50
Toluol, pure (7.21 lbs. per gal.) ..... gal.		@	
Turpentine, spirits ..... gal.	.90	@	
wood, steam distilled .. gal.	.81	@	

Substitutes

Black ..... lb.	.08	@	.14
Brown ..... lb.	.10	@	.15
White ..... lb.	.09	@	.15
Brown factice ..... lb.	.09	@	.15
White factice ..... lb.	.09	@	.15½

Vulcanizing Ingredients

Black hypo ..... lb.	.18	@	
13% F. S. ..... lb.	.20	@	
Sulphur chloride ..... lb.	.08	@	.13½
Sulphur, Bergenport brand, 100% pure (bbls.) ... cwt.	2.60	@	2.90
(bags) ... cwt.	2.35	@	2.65
Sulphur, Bklyn bd. (bbls.). cwt.	2.60	@	3.15
superfine com. (bgs.) .. cwt.	2.00	@	2.50
(bbls.) .. cwt.	2.40	@	2.90
Rubber makers ..... lb.	.03	@	.03¼

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com . lb.	.40	@	.45
ceresine, white ..... lb.	.10	@	.12
carnauba ..... lb.	.19	@	
montan ..... lb.	.05	@	.06½
ozokerite, black ..... lb.	.18	@	.24
green ..... lb.	.27	@	.28

Paraffin

122/124 white crude scale. lb.	.04½	@	
124/126 white crude scale. lb.	.04½	@	.04⅝
120/122 fully refined .... lb.	.05½	@	.05¾
125/127 fully refined .... lb.	.05½	@	

GRITLESS MINERAL RUBBER

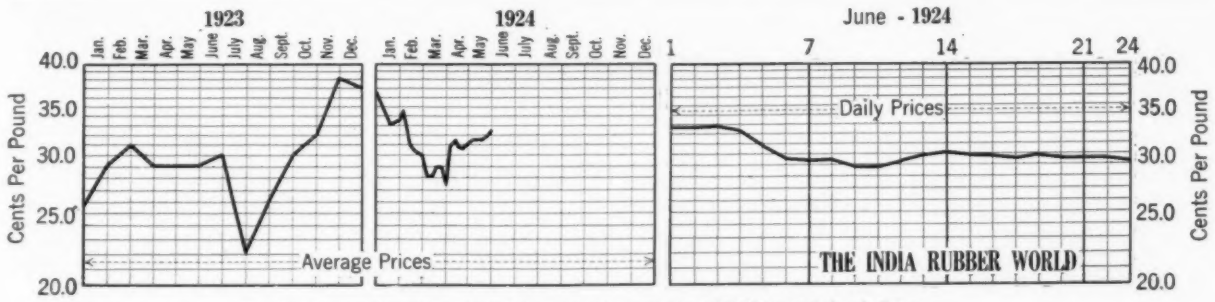
The occurrence of gritty particles in calendered rubber is a source of serious trouble often very difficult to eliminate in spite of every effort to keep rubber and compounding ingredients clean. If the grit appears as small hard black grains it is probably particles of carbon or other foreign matter from the mineral rubber used. The way to eliminate it is to discard all MR made from carbonized ingredients.

AMERICAN EXPORTS OF RUBBER SOLES AND HEELS HAVE SHOWN A steady advance during the present year, the total values for the first four months being as follows: January, $50,325; February, $49,437; March, $72,116; and April, $72,068. The April figures represent a new record at 235,891 pounds, as compared with the previous high record for March, 1924, of 221,845 pounds.

DECLINE IN AMERICAN GOLF BALL IMPORTS

AMERICAN EXPORTS OF RUBBER SOLES AND HEELS HAVE SHOWN A were imported into the United States during the first four months of the present year only 781,179 golf balls, value $291,527, as compared with 1,341,008, value $561,064, in the corresponding period of 1923. Statistics also show that during the entire year of 1923 this country imported 2,839,166 of these balls, at a value of $1,173,679. Almost the entire supply was furnished by England, or 2,674,809, value $1,121,543. Of the remainder Scotland's share was 122,304, value $34,985; and that of France, 42,028 balls, value $17,141.

As during 1923 there was an estimated consumption in the United States of approximately 13,200,000 golf balls, with 21.5 per cent coming from foreign sources, it would seem that there will be a better opportunity this year for the products of American manufacturers.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The price of spot middling upland cotton on June 2 was 32.65 cents and on June 24, 29.15. The steady decline is attributed to unfavorable weather, poor crop reports, and slowing up in American industry. New York houses complain that business is almost at zero. Government crop report, May 25, gave the condition as 65.6 per cent; this year's acreage is placed at 39,000,000, an increase of 5.7 per cent over last season. The indicated crop is 11,125,000 to 11,435,000 bales, or about a million bales less than requirements.

The report of the census shows a sharper falling off in domestic mill consumption than anticipated. Domestic consumption for the first ten months of this season is reported at 4,991,163 bales against 5,661,412 for the same period last season.

EGYPTIAN COTTON. The staple market rules extremely dull, with downward prices fluctuating both ways daily according to the weather in the cotton growing areas. Spots are everywhere cheaper than shipments and hold a value midway between shipment prices of old and new crops.

Medium Uppers can be bought at around 40 cents and Medium Sakels at very little if any dearer.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market is comparatively quiet, with somewhat more transactions current than obtained a month ago. Increasing inquiries for fabrics are expected by the trade as present inventories become exhausted and the value of the new crop cotton becomes more definitely defined.

RAINCOAT FABRICS. Raincoat business has been very quiet the past month in the absence of demand. Manufacturers of raincoats have started operations again after a period of inter-season dullness and are utilizing such stocks as they have on hand, which means that new orders will be placed soon, as inventories are low. Thus the situation is greatly improved over that of last month, when the cutters were at a standstill.

SHEETINGS. The curtailment of cotton mill production, now general, still continues and probably is greater than in many years. The mills have small stocks and are holding prices with fair degree of firmness, figuring that buyers are taking only what they absolutely need and will pay the prices asked. Most orders are for small quantities for immediate consumption and result in no particular activity.

TIRE FABRICS. The market is quiet. Tire companies have slackened their rate of production, as is customary in summer. They are also attempting to reduce inventories in conformity with the reduction in manufacturing schedules of automobile concerns generally. There are indications that rubber companies are spreading out as far as possible their present stocks of fabrics while awaiting developments on the growing cotton crop before covering their future requirements. Some orders are being placed at ridiculously low figures on account of the desperate need for business of some fabric mills. Present fabric prices are based on raw cotton at prices several cents under the current market.

Tire manufacturing probably having passed its peak rate for this year at the end of the first quarter, the demand for tire fabrics for the remainder of the year is not expected to greatly exceed that of last year. The larger tire companies are tied up with cost plus contracts considered ample to tide them over the remaining quieter months of the years.

New York Quotations

June 24, 1924

Drills

38-inch 2.00-yard	*yard*	$0.22 @
40-inch 3.47-yard		.12¾ @
52-inch 1.90-yard		.24½ @
60-inch 1.52-yard		.30 @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	*yard*	.23½ @
40-inch 1.47-yard		.31¾ @
72-inch 16.66-ounce		.52½ @
72-inch 17.21-ounce		.53¾ @

MECHANICAL

Hose	*pound*	.45 @
Belting		.44 @

TENNIS

52-inch 1.35 yard	*yard*	.35 @

Hollands

DEAD FINISH

Standard, 36-inch	*yard*	.19½ @
41-inch		.23½ @

FLAT FINISH

Imperial, 36-inch		.15½ @
40-inch		.17½ @

Osnaburgs

40-inch 2.35-yard	*yard*	.19⅛ @
40-inch 2.48-yard		.18½ @
40-inch 3.00-yard		.15⅛ @
37-inch 2.42-yard		.18⅝ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	$0.13 @
Bombazine 60 x 48		.12¼ @
Plaids 60 x 48		.13 @
Plaids 48 x 48		.12 @
Surface prints 60 x 48		.13 @
Surface prints 64 x 60		.14 @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.16½ @
48 x 48, 2.85-yard		.14½ @
64 x 68, 3.15-yard		.14¾ @
56 x 60, 3.60-yard		.12¼ @
48 x 44, 3.75-yard		.11 @

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.09 @
40 x 40, 6.15-yard		.07½ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded	*pound*	$0.60 @ .62
Peeler, karded		.51 @ .53

CORD 23/5/3

Egyptian, combed	*pound*	.68 @ .72
Egyptian, karded		.62 @ .65
Peeler, karded		.54 @ .56

CORD 13/3/3

Peeler, karded	*pound*	.52 @ .54

LENO BREAKER

8-oz. Peeler, karded	*pound*	.51 @ .53
10-oz. Peeler, karded		.51 @ .53

CHAFER

8.25-oz. Peeler, karded	*pound*	.49 @ .50
9.5-oz. Peeler, karded		.51 @ .53
12-oz. Peeler, karded		.51 @ .53
14-oz. Peeler, karded		.51 @ .53

The Cotton Outlook

The American Crop Prospect

FIRST reports on the condition of the American cotton crop as of May 25 are not reassuring. The government report is 65.6 per cent, compared with 71 a year ago and a previous ten-year average of 72.8. This is the lowest May estimate on record except that of 62.4 in 1920. It is generally interpreted in the trade as indicating a yield of approximately 11,000,000 bales, or about 1,000,000 bales below what is regarded as the normal consumption of American cotton. The American Cotton Association places the condition of the crop at 64.8 per cent. Assuming a planted acreage of 38,500,000 acres, a crop of 10,867,000 bales is indicated.

Southwest Cotton Banned

Rubber manufacturers using cotton are concerned with the announcement that the State of California, recognizing the visitation of the boll weevil (to which the Southwest had been deemed immune) in the Postvale section near Tucson, has quarantined against the importation of cotton products or seed from Arizona; and similar action was expected soon from Texas and New Mexico. The ban will be removed when proof is given of the destruction of all infected crops. The Attorney General of Arizona has advised the Governor that the Postvale product can be treated as contraband and destroyed as a menace or nuisance.

The owners of 9,000 acres having infected crops have refused an offer from Governor Hunt to pay $200,000 for damages that may be inflicted by the State, and will try to have the Federal Court enjoin the state authorities from taking any drastic measures. Meanwhile cotton-growers through the entire Southwest are taking exceptional precautions against the spread of the trouble.

Better Reports from Egypt and Elsewhere

Good progress is reported for the crop in both upper and lower Egypt. Acreage returns show an increase of about 10 per cent, especially in the northern districts of the Delta, or a total of about 1,800,000 acres.

In lower Egypt it is reported that the amount of Sakellaridis cotton planted this year is less than during the preceding season, while a corresponding increase in the planting of the Zagora and Pilion varieties has been recorded.

England Pushing Cultivation in All Colonies

Alarmed at the menace of continued small American cotton crops under boll weevil conditions, and alive to the opportunity thus afforded, England is enthusiastically pushing cultivation of the staple in all her colonies with the hope of making the British Empire independent of American raw cotton. So ran the report of Edward E. Bartlett, Jr., president of the New York Cotton Exchange, on his return from a study of the situation in England late in May. He believes that we are not fully alive to the extent to which England is going into cotton growing, and asserts that the only way to check this menace is by America getting back into production on the same scale that existed before the boll weevil began to take its toll of millions of bales annually. Normal production will mean normal prices and discourage foreign competition in growing cotton.

England is looking chiefly for her future raw cotton supply to Uganda, Sudan, Nyasaland and other British African colonies, which produced over 200,000 bales last season against some 33,000 bales in Australia. Big interests in Johannesburg and elsewhere are securing options on enormous tracts of suitable land. For example, the Kassala Cotton Co., Limited, financed by British capital, will cultivate as much land in Kassala Province as can be brought under irrigation. The Sudan Government has granted a 40-year concession in exchange for a £300,000 loan with which 217 miles of railroad is being constructed to connect this region with the main line to Port Sudan. The first crop under the concession will be of the Sakellaridis type from about 9,000 acres now under irrigation, and a canal is now under construction to irrigate 10,000 acres of virgin land.

Other Countries Producing More Cotton

Henceforth it is likely that the British and French will race hard in cotton production, each nation trying to be the first to emancipate herself from dependence on America. France needs nearly 3,000,000 tons of cotton annually, of which only 2,500 tons is now grown in the French Sudan, but she hopes to increase this and to develop a cotton industry of large proportions along the banks of the Niger river in French West Africa.

Russia Buying American Cotton

That conditions in Russia are again approaching normalcy seems to be indicated by the fact that the All Russia Textile Syndicate, Inc., has since the first of the year purchased and shipped to Russia over 200,000 bales of American cotton at a cost of $35,000,000 to $40,000,000 on credits supplied by the Chase National Bank of New York. The syndicate, it is stated, has 7,250,000 spindles, mostly in active operation.

Convention of American Cotton Manufacturers

The 28th annual convention of the American Cotton Manufacturers' Association, held on May 27 and 28 at the Hotel Traymore, Atlantic City, New Jersey, proved to be one of the largest and most representative gatherings of the industry in recent years. The outstanding feature of the convention was the comprehensive and detailed analytic discussion of the present deplorable condition of the textile trade with its widespread curtailment among both northern and southern mills. Northern and southern manufacturers manifested a hopeful disposition to cooperate in the development of a policy toward foreign competition, the tariff and merchandising problems affecting the production and distribution of mill products.

At the convention and generally throughout the trade the opinion is frequently expressed that the lowest point in the curve of the prolonged cotton goods depression has been touched and that a change for the better is imminent. Inquiries from buyers are replacing the apathy of recent months and experienced sellers regard the present attitude of large buyers as significant.

Cotton Notes

European and American cotton experts met in Washington, D. C., on June 16, at the invitation of the Department of Agriculture and prepared a limited number of "key" sets of the universal cotton standards for use in deciding all disputes. One set will be placed in reserve in the vault of the Bank of England, another in vaults here.

Each European cotton exchange maintaining an arbitration board will retain a "key" set, as will exchanges at the ten designated spot markets and the principal arbitration committees in this country, and the Cotton Exchange. Representatives of the European exchange will include Liverpool, Manchester and Bremen.

Since March it is believed that textile mill curtailment has increased so that barely 70 per cent of the American spindle capacity is now employed. The demand for goods continues very light despite quoted prices that show a loss from 5 cents to 6 cents per pound on replacement mill costs for unfinished cloths.

Retailers and jobbers are ordering goods in small lots for early shipment and are not making forward commitments at this time.

Conditions throughout the world in every country manufacturing cotton goods, even including the United States, are abnormal, and consequently the merchandise that reaches this country from abroad has been produced on a wage schedule and under mill operating conditions that make the duties as quoted in the Fordney-McCumber tariff act inadequate when they are imposed upon a foreign valuation of the fabrics. If this can be changed, and the valuation based upon cost in the United States, then the 40, 50 or 60 per cent duty would act as some measure of protection to our domestic cotton goods industry. This is the need of the present day in our textile industry.

COTTON GROWING EXPERIMENTS IN DUTCH GUIANA

In a bulletin issued by The Netherlands Chamber of Commerce in New York, Inc., 44 Beaver street, New York, N. Y., a report is given regarding governmental experiments in the growing of long-staple cotton in Surinam, Dutch Guiana. According to this report, the first crop sown during April-May, 1923, produced in less than six months a crop of 2,310 pounds of seed cotton, which gave 632 pounds of lint cotton per acre. The second crop, although grown under less favorable conditions, produced 741 pounds of lint cotton per acre, this comparing well with the average crops in the United States or Egypt. The indications are that Surinam offers excellent opportunities for the growing of Sea Island cotton.

Metal Market Review

New York

Although prices are fairly firm, dullness continues in all the markets. The demand for copper and lead represents a slight improvement, while tin prices are also a little higher, following a spectacular decline. Those familiar with conditions in the steel industry state that an improvement may be expected by August or September, after a decline of about 30 per cent in steel ingot production during April, followed by a still further falling off of 20 per cent in May. According to the American Metal Market: "Steel production has decreased only slightly since the first of June, after large decreases in April and May. Assuming capacity at 54,000,000 tons, the present ingot production is at about 45 per cent."

ANTIMONY. Conflicting opinions as to the future of this metal make the gaging of the true situation very difficult. At present lower prices are expected in London, unless a revival of buying takes place in the United States, where purchasing has been from hand to mouth.

COPPER. Total shipments in May were 222,000,000 pounds, ranking among the five highest shipments in the history of the industry. April shipments had been 234,000,000 pounds. According to statistics prepared by the United States Geological Survey, the production of domestic copper in 1922 was 950,285,947 pounds and in 1923 1,434,999,962 pounds, while exports in 1922 were 705,025,268 pounds, and in 1923, 792,073,512 pounds. Domestic consumption in 1922 was 896,633,833 pounds, and in 1923, 1,300,473,331 pounds.

LEAD. It seems to be the general expectation of both buyers and sellers that lead prices will be higher in a few weeks. The apparent consumption of lead in the United States during 1923, according to the United States Geological Survey, was 574,043 tons, compared with 492,705 tons in 1922 and 444,872 tons in 1921.

NICKEL. Quotations for shot and ingot nickel are unchanged at 27 to 32 cents per pound, with electrolytic nickel held at 30 to 32 cents by the leading producers. Shot and ingot nickel in the outside market are quoted at 28 to 32 cents a pound.

STEEL. The two greatest years of steel production on record have been 1917 and 1923, according to reports by the American Iron and Steel Institute. It is further stated that the year 1923 alone stood 27 per cent above the average of the five post-war years.

TIN. The London market shows strength, notwithstanding extreme dullness in that of America. Dealers and operators apparently have more confidence in the tin market than the consumers. During April and May tin prices dropped more than 17 cents.

ZINC. Shipments of zinc slabs totaled since January 1 approximately 1,414,540 tons, against 1,277,300 last year. However, in May, stocks of zinc increased 9,586 tons, according to figures prepared by the American Zinc Institute. In April the increase in stocks amounted to only 704 tons, while in March there was a decrease of 5,118 tons.

Basic Metals

JUNE 24, 1924

Aluminum, virgin, 98@99 per cent	28.00 @ 29.00
Antimony, pound	.08⅜ @ .08⅝
Copper—Lake, spot, pound	.12⅝ @ .12¾
Electrolytic, spot	.12½ @
Casting refinery	.12¼ @
Lead, spot, New York, pound	7.00 @
Lead, spot, East St. Louis	6.80 @ 6.85
Nickel, ingot, pound	.29 @ .32
Tin, spot	.43½ @
Zinc, spot, New York	6.07½ @ 6.12½
Zinc, spot, East St. Louis	5.72½ @ 5.77¼

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSE

	Cents per pound
Bright basic	4.25 @ 4.50
Annealed soft	4.50 @ 4.75
Galvanized annealed	5.15 @ 5.40
Coppered basic	5.15 @ 5.40
Tinned soft Bessemer	6.15 @ 6.40

*Regular extras for lighter gage.

Copper Wire

	F. O. B. Factory
Bare copper wire, lb.	*.14⅞ @
No. 6 B. & S. gage, lb.	.14⅞ @
No. 8 B. & S. gage, lb.	.14⅞ @
No. 14 B. & S. gage, lb.	.15⅞ @

*Base price.

TIRE AND TUBE EXPORTS INCREASING

Although export shipments of American tires have been lower this year than for the corresponding months of 1923, the figures for both pneumatic casings and tubes for the period from January to April inclusive are showing a steady increase, and indicating a probable trade recovery. There is a decline, however, in exports of solid tires, following increasing shipments of these goods to foreign countries during the last three years!

AMERICAN EXPORTS, JANUARY-APRIL, 1924

	Pneumatics	Solids	Tubes
January	$866,651	$325,487	$138,753
February	1,043,452	240,283	166,088
March	1,154,201	285,975	161,636
April	1,402,594	209,520	182,767

DURING THE FIRST FOUR MONTHS OF THE PRESENT YEAR England, at a total value of $133,034, has led other countries in importations of American-made rubber toys, balls, and balloons. Canada follows at $48,544, while other countries taking greater or less amounts have been Mexico, Cuba, Australia, New Zealand, France, Argentina, and British South Africa.

THE MONTHLY PRODUCTION IN THE UNITED STATES OF CASINGS, solid tires and tubes declined during 1923 from approximately 4,200,000 casings in January to 3,200,000 in December; inner tubes, from 5,300,000 in January to 4,400,000 in December; and solid tires from about 160,000 to a little less than 150,000.

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
EUROPE													
Austria	.....	.....	.....	.....	.....	.....	360	$219	72	$36	.....	.....	.....
Azores and Madeira Islands	.....	.....	.....	.....	18	$69	.....	.....	.....	.....	.....	.....	.....
Belgium	$600	$214	.....	$1,809	.....	.....	144	96	.....	.....	$28	.....	.....
Bulgaria	.....	.....	.....	.....	.....	.....	24	9	96	50	.....	.....	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$46	.....
Denmark	3,675	1,182	$1,480	.....	444	960	240	523	26,696	22,150	166	.....	.....
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	11	27	.....	.....	.....
Finland	444	.....	138	.....	.....	.....	.....	.....	.....	.....	.....	63	.....
France	3,026	419	3,756	20,511	.....	.....	48	46	.....	.....	.....	122	.....
Germany	.....	.....	1,698	.....	.....	.....	48	24	.....	.....	255	328	.....
Greece	.....	.....	.....	.....	6	21	.....	.....	.....	.....	.....	300	.....
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	162	550	.....	.....	.....	.....	.....	.....	.....
Italy	.....	.....	.....	4,016	2	11	1	2	88	176	.....	2,070	$25
Latvia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	920	1,914	384	.....	.....	.....	.....	.....	.....	.....	703	206	.....
Norway	185	228	.....	.....	481	1,608	903	1,921	3,220	4,015	.....	89	.....
Poland and Danzig	.....	.....	.....	.....	.....	.....	45	15	.....	.....	21	.....	.....
Portugal	.....	95	.....	.....	404	1,616	.....	.....	.....	.....	545	413	.....
Rumania	.....	360	509	.....	.....	.....	.....	.....	.....	.....	.....	.....	441
Russia in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	314	177	221	.....	660	2,256	11,832	7,099	.....	.....	319	404	.....
Sweden	1,919	1,758	536	.....	1,434	4,399	1,881	4,758	48	78	762	381	.....
Switzerland	10	.....	.....	4,902	.....	.....	.....	.....	112	151	480	336	12
Ukraine	.....	.....	.....	.....	.....	.....	.....	.....	50	45	.....	.....	.....
England	28,971	23,216	7,065	27,235	4,169	12,192	3,611	1,952	78,089	60,477	4,475	11,266	2,527
Scotland	2,116	145	1,047	.....	36	115	239	127	3,072	2,332	.....	245	132
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS	$42,180	$29,708	$16,834	$58,473	7,816	$23,797	19,376	$16,791	111,554	$89,537	$7,754	$16,269	$3,137
NORTH AMERICA													
Canada	$11,184	$8,632	$16,352	$2,878	2,529	85,837	4,014	$2,232	10,588	$8,967	$1,314	$26,777	$3,111
British Honduras	.....	29	.....	.....	.....	.....	.....	.....	644	844	.....	.....	.....
Costa Rica	89	1,436	60	.....	.....	.....	.....	.....	.....	.....	784	.....	.....
Guatemala	933	2,002	419	.....	.....	.....	55	43	1,659	1,274	989	.....	1,736
Honduras	98	948	56	.....	.....	.....	.....	.....	47	62	791	.....	207
Nicaragua	358	177	172	.....	.....	.....	.....	.....	1,237	1,423	745	.....	.....
Panama	338	9,326	72	.....	30	97	.....	.....	3,549	3,081	1,310	269	306
Salvador	359	166	.....	.....	.....	.....	.....	.....	.....	.....	1,047	122	263
Mexico	15,856	16,653	6,492	2,554	122	473	9,881	6,263	41,622	32,442	17,279	3,738	19,282
Miquelon and St. Pierre Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	299
Newfoundland and Labrador	414	921	7	.....	7,847	22,927	1,083	723	7,260	4,333	736	15	8,192
Bermuda	.....	58	.....	.....	8	22	19	14	1,174	1,327	118	41	102
Barbados	.....	44	.....	.....	.....	.....	.....	.....	72	57	.....	115	.....
Jamaica	.....	945	177	.....	.....	.....	.....	.....	2,570	1,952	524	1,939	292
Trinidad and Tobago	262	470	328	.....	.....	.....	.....	.....	756	623	27	312	.....
Other British West Indies	837	258	264	.....	.....	.....	144	100	1,962	2,129	.....	215	23
Cuba	925	9,185	1,941	36	187	664	5,144	3,597	19,851	13,122	9,185	5,448	37,746
Dominican Republic	39	888	1,190	.....	.....	.....	312	371	1,833	1,261	184	179	55
Dutch West Indies	45	29	.....	.....	.....	.....	.....	.....	5,272	3,555	131	.....	377
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	.....
Haiti	515	24	.....	.....	.....	.....	.....	.....	1,168	1,152	1,556	.....	12
Virgin Islands of United States	.....	.....	216	.....	.....	.....	.....	.....	479	431	248	.....	13
TOTALS	$32,252	$52,191	$27,746	$5,468	10,723	$30,020	20,652	$13,343	101,743	$78,035	$36,968	$39,230	$72,016
SOUTH AMERICA													
Argentina	$5,566	$1,168	$1,064	.....	.....	.....	1,198	$2,021	.....	.....	$5,197	$8,277	$2,857
Bolivia	3,963	716	300	.....	.....	.....	.....	.....	.....	.....	114	.....	.....
Brazil	7,371	768	1,082	$674	.....	.....	3,395	2,490	.....	.....	.....	5,278	.....
Chile	21,739	3,501	568	.....	.....	.....	.....	.....	.....	.....	.....	798	544
Colombia	1,231	2,624	815	.....	.....	.....	240	179	1,399	$1,343	2,746	568	38
Ecuador	331	33	636	.....	.....	.....	.....	.....	708	780	270	.....	.....
British Guiana	.....	11	27	.....	.....	.....	.....	.....	120	138	.....	.....	.....
Dutch Guiana	101	.....	.....	.....	.....	.....	.....	.....	192	176	95	.....	.....
Paraguay	.....	.....	261	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	4,544	5,953	1,427	.....	100	$459	96	59	284	462	326	433	427
Uruguay	695	432	616	.....	1	2	5,470	4,284	8	6	1,913	1,086	2,997
Venezuela	609	380	5,015	.....	.....	.....	.....	.....	48	31	2,089	250	264
TOTALS	$46,150	$15,586	$11,811	$674	101	$461	10,399	$9,033	2,759	$2,936	$12,750	$16,690	$7,127
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$7,311	$7,214	$459	.....	6	$12	24	$12	2,495	$2,382	.....	$38	.....
Ceylon	.....	109	.....	.....	.....	.....	.....	.....	.....	.....	.....	667	.....
Straits Settlements	.....	125	.....	.....	.....	.....	96	80	1,300	1,217	.....	1,368	.....
China	461	332	.....	$2,728	.....	.....	11	23	378	378	.....	3,427	.....
Chosen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	456	.....
Java and Madura	1,426	1,885	687	.....	.....	.....	.....	.....	120	198	.....	.....	.....
Other Dutch East Indies	915	47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Far Eastern Republic	.....	.....	.....	.....	24	96	82	237	.....	.....	.....	.....	$232
French Indo-China	300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	5,177	140	.....	.....	.....	.....	.....	135	123	$54	844	.....
Japan	23,958	16,354	13,272	17,418	.....	.....	168	189	46	27	.....	967	.....
Kwantung, leased territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palestine and Syria	17	170	.....	.....	16	13	.....	.....	.....	.....	.....	.....	.....
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands	4,308	2,186	762	.....	840	2,136	1,380	963	17,136	15,335	11,829	1,584	10,032
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	486
Turkey in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS	$38,696	$33,599	$15,320	$20,146	886	$2,257	1,761	$1,504	21,610	$19,660	$11,883	$9,351	$10,750

United States by Countries During April, 1924

Pneumatic Casings			Solid Tires		Pneumatic Tubes			Tire Repair Materials	Hard Rubber Goods			Rubber Water Bottles and Fountain Syringes	Other Druggists' Rubber Sundries	Bathing Caps	Rubber Toys, Balls and Balloons
Automobile			Automobile and Motor Truck		Automobile				Battery Jars and Accessories	Other Electrical Supplies					
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Value	Value	Value	Others Value	Value	Value	Value	Value
															$27
76	$1,075														
491	9,679				401	$966	$13	$103				$60	$632	$1,598	63
								29							
3,743	41,612	$1,180	$2,263		1,516	2,446		2,896			$14		654	2,186	201
1,921	22,759	305			1,986	3,292	38	244				372	136	1,403	1,141
140	2,198				3	8		163			5,619				498
			178												
276	4,650		2,000		500	568		574							
6	161														
60	900	120													
756	6,783		142		970	1,325	10	712				626	1,280	204	4
35	461				175	324									
34	443														
848	11,350	373			552	1,333	67	254			38	254	1,157	1,598	2,535
347	7,298		1,829		165	414		724					328	326	145
84	1,308	728			224	439									
495	6,015	148			1,967	4,066						434	56	53	
					86	284									
35	250				45	168									
2,751	43,438	56	3,695	$103	2,254	4,940	7	816			132		36		135
8,852	126,855	666	1,446		8,149	15,096	68	566				185	319	1,819	1,608
398	4,631	230			114	261	5	135				51		269	3
11,129	124,717	56	58,610		5,972	12,971	207	2,426	$397	$2,928	26,205	90	17,687	11,099	30,554
116	1,083		7,222		200	234					1		392	1,475	2,517
															392
32,573	$417,666	$3,862	$77,685	$103	25,279	$49,135	$415	$9,642	$397	$2,928	$32,109	$2,072	$22,641	$22,066	$39,823
7,350	$77,411	$836	$17,081	$891	2,833	$10,199	$58	$10,092	$3,938	$2,791	$14,510	$129	$13,677	$7,414	$18,633
38	444				70	95		5		1		9		17	
70	1,539				93	128							224		
68	1,378				28	117					43		76		202
76	1,041		979		194	367		27				14	62	8	4
136	1,885	74	150		121	255		3			28		431		50
490	7,234	102	1,481	305	1,015	1,382		375					456	163	
76	1,735		594	17	75	233		33						32	495
12,895	147,488	1,585	4,598	1,352	11,976	21,374	353	1,970		454	4,255	458	2,254	12	1,462
214	2,757		320		233	381		252			14		52		156
				691							47		265		
34	363		270		81	137		44							
378	5,441		760	225	337	1,253		162				138	10	5	
169	2,307		135		153	362		20					22		
54	947		670	10	62	161		25		31	103		4		
6,914	79,055	1,114	14,723	67	6,192	11,268	139	1,314	26	238	929	1,390	6,113	385	3,360
1,216	12,788	214	4,872	217	1,195	1,891	25	162			15		63		
103	2,557				159	508		19					30	24	
265	5,802	40			376	808		101							
80	784	61			216	374							97		
30,626	$352,956	$4,026	$46,633	$3,775	25,409	$51,293	$575	$14,606	$3,964	$3,515	$19,944	$2,138	$23,836	$8,060	$24,362
4,957	$73,277	$56	$6,186	$2,550	3,566	$7,996		$1,080			$29	$2,960	$6,015	$224	
108	1,571		192		118	323		32					5	25	$274
3,493	20,787	39	1,576		3,231	3,052		971				441	256		168
1,344	23,007	131	1,193	916	933	1,870	$4	42			93	132	50		200
597	11,150	112	969		521	1,107	261	355			50	17	611	14	656
272	4,943			12	242	427			$100				151		353
41	514		313		22	50		24							
44	448				66	96		35							
											159				
3,681	48,386		774		2,919	6,139		563			658	45	174		394
1,039	12,276				117	217		438			125		522		
946	9,616	144	180		1,887	4,462	131	161	16		77	320	747		358
16,522	$205,875	$482	$11,383	$3,478	13,622	$25,739	$396	$3,701	$116		$1,191	$3,915	$8,531	$263	$2,403
162	$1,234				289	$388		$15							
752	6,829		$7,307	$8,645	696	1,104						$134	$362		$1,491
1,001	12,278		1,498	985	342	843									
120	776		671											$15	52
1,208	9,052	$144	417	275	289	580		161	$316	$1,779	$90		419	266	502
								10							
1,139	11,954		4,007	2,127	800	1,149							14	381	1,328
136	1,251		636		35	56									
34	374				48	72									448
12	518				6	10		128							
6,415	64,059		9,102		3,272	5,362		160	50			84	2,571	1,481	
											1,142				
52	928		191		76	181		217							
2	27				24	37									
3,278	39,432	1,196	9,361	12,054	4,279	7,742	$553	662	20		113	1,180	1,387		979
12	140				2	15									
14,323	$148,852	$1,340	$33,190	$24,086	10,158	$17,539	$553	$1,353	$386	$1,779	$1,345	$1,398	$4,753	$2,143	$4,800

Exports of India Rubber Manufactures from the

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
OCEANIA													
Australia	$14,218	$3,124	$4,741	.....	144	$464	.....	.....	2,230	$2,003	.....	$37,468	$212
British Oceania	.....	76	.....	.....	.....	.....	.....	.....	498	553	.....	.....	.....
French Oceania	.....	104	15	.....	.....	.....	.....	.....	1,562	1,487	$12	.....	20
New Zealand	3,986	1,685	2,005	.....	3,129	10,039	.....	.....	.....	.....	904	262	.....
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	240	285	.....	.....	.....
TOTALS	$18,204	$4,989	$6,761	.....	3,273	$10,503	.....	.....	4,530	$4,328	$916	$37,730	$232
AFRICA													
Belgian Kongo	$1,149	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British West Africa	69	.....	$20	.....	24	$61	.....	.....	.....	.....	.....	.....	.....
British South Africa	32,509	$26,542	3,346	.....	232	406	1,112	$1,590	1,003	$1,501	$1,520	$2,374	$3,491
British East Africa	529	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	406	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	.....	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37	.....	.....
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liberia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morocco	.....	1,907	113	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	436	1,575	889	.....	.....	.....	.....	.....	228	325	172	.....	.....
Other Portuguese Africa	.....	.....	721	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS	$34,692	$30,024	$5,089	.....	256	$467	1,112	$1,590	1,231	$1,826	$1,797	$2,780	$3,491
GRAND TOTALS	$212,174	$166,097	$83,561	$84,761	23,055	$67,505	53,300	$42,261	243,427	$196,322	$72,068	$122,050	$96,753

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	March, 1924 Pounds	March, 1924 Value	Twelve Months Ended March, 1924 April-March Pounds	Twelve Months Ended March, 1924 April-March Value
UNMANUFACTURED				
Rubber, gutta percha, etc.,				
From United Kingdom	392,189	$108,657	4,473,218	$1,385,714
United States	3,001,618	762,866	19,828,526	5,353,629
Belgium	.....	.....	.....	.....
Brazil	.....	.....	.....	.....
British East Indies—India	.....	.....	.....	.....
Ceylon	.....	.....	.....	.....
Straits Settlements	237,353	56,638	4,248,158	1,226,378
Dutch East Indies	.....	.....	202,112	52,102
France	4,554	872	9,178	2,035
Other countries	.....	.....	116,052	27,536
Totals	3,635,714	$929,033	28,877,244	$8,047,394
Rubber recovered	440,465	$45,984	2,762,444	$264,771
Rubber, powdered and rubber or gutta percha scrap	544,937	17,660	3,785,505	135,982
Balata	.....	.....	7,493	6,527
Rubber substitutes	73,740	21,730	788,303	157,855
Totals	1,059,142	$85,314	7,343,745	$565,135
PARTLY MANUFACTURED				
Hard rubber sheets and rods	14,200	$12,014	149,304	$95,267
Hard rubber tubes	.....	2,721	.....	19,667
Rubber thread, not covered	6,653	7,368	83,601	92,284
Totals	20,853	$22,103	232,905	$207,218
MANUFACTURED				
Belting	.....	$21,872	.....	$153,328
Hose	.....	13,315	.....	123,883
Packing	.....	5,777	.....	49,780
Boots and shoes *pairs*	12,429	14,854	144,642	200,510
Clothing, including waterproofed	.....	22,060	.....	186,276
Gloves	.....	1,936	.....	17,002
Hot water bottles	.....	1,874	.....	27,075
Tires, solid *number*	3,200	18,651	25,779	104,841
Tires, pneumatic *number*	11,351	103,752	82,124	848,246
Inner tubes *number*	7,214	7,847	42,194	60,211
Elastic, round or flat	.....	26,047	.....	279,235
Mats and matting	.....	1,150	.....	17,404
Cement	.....	12,024	.....	52,415
Other rubber manufactures	.....	182,959	.....	1,481,020
Totals	.....	$434,118	.....	$3,601,226
Total rubber imports	.....	$1,470,568	.....	$12,420,973

Exports of Domestic and Foreign Rubber Goods

	March, 1924 Produce of Canada Value	March, 1924 Re-exports of Foreign Goods Value	Twelve Months Ended March, 1924 April-March Produce of Canada Value	Twelve Months Ended March, 1924 April-March Re-exports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$12,638	.....	$66,913	$63,997
Totals	$12,638	.....	$66,913	$63,997
MANUFACTURED				
Belting	$33,944	.....	$269,243	.....
Canvas shoes with rubber soles	215,757	.....	1,285,796	.....
Boots and shoes	42,734	.....	653,793	.....
Clothing, including waterproofed	1,150	.....	17,242	.....
Hose	20,594	.....	139,073	.....
Tires, casings	576,248	.....	5,701,903	.....
Inner tubes	80,554	.....	641,244	.....
Pneumatic	.....	.....	.....	.....
Solid	15,026	.....	162,500	.....
Vehicle	.....	$158	.....	$8,620
Other rubber manufactures	38,198	3,057	273,531	36,531
Totals	$1,024,205	$3,215	$9,144,325	$45,151
Totals, rubber exports	$1,036,843	$3,215	$9,211,238	$109,148

Imports of Crude Rubber Into the United States by Customs Districts

	April, 1923 Pounds	April, 1923 Value	April, 1924 Pounds	April, 1924 Value
Massachusetts	1,451,719	$451,986	2,027,059	$476,788
New York	62,423,183	19,496,187	80,921,601	19,578,489
Philadelphia	20,668	4,080	.....	.....
Maryland	1,758,625	444,362	660,800	153,558
San Antonio	.....	.....	177,783	31,734
El Paso	56,000	11,200	.....	.....
Los Angeles	1,753,100	874,655	1,154,222	266,442
Oregon	.....	.....	33,600	8,612
San Francisco	1,288,192	419,388	11,200	2,983
Washington	33,600	11,760	.....	.....
Colorado	661,688	162,780	.....	.....
Chicago	.....	.....	56,716	13,215
Totals	69,446,775	$21,876,398	85,042,981	$20,531,821

United States Crude and Waste Rubber Imports for 1924 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1924	Total 1923	Balata	Miscellaneous	Waste
January *tons*	20,611	731	181	88	.....	.....	21,611	31,197	23	249	95
February	29,977	1,501	192	93	.....	.....	31,763	24,220	47	799	53
March	16,009	980	663	33	67	.....	17,752	33,916	86	98	184
April	41,438	686	139	9	164	.....	42,436	31,588	55	1,371	114
May	22,466	1,176	70	17	185	.....	23,914	36,184½	55	139	104
Totals, 5 months, 1924 *tons*	130,501	5,074	1,245	240	416	.....	137,476	.....	266	2,656	550
Totals, 5 months, 1923	147,373	6,856	2,331	227	309	9½	.....	157,105½	308	3,359	2,797

Compiled from Rubber Association statistics.

United States by Countries During April, 1924—*Continued*

Pneumatic Casings			Solid Tires		Pneumatic Tubes				Hard Rubber Goods						
Automobile			Automobile and Motor Truck		Automobile										
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Tire Repair Materials Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	Rubber Water Bottles and Fountain Syringes Value	Other Druggists' Rubber Sundries Value	Bathing Caps Value	Rubber Toys, Balls and Balloons Value
7,658	$119,355	$4,350	$19,547	$1,847	4,539	$11,576	$286	$7,501	$363	$678	$78	$18	$5,314	.....	$2,681
48	634	.....	.....	.....	30	57	.....	36	.....	.....	.....	.....	.....	.....	.....
36	394	.....	429	79	18	35	.....	.....	.....	177	59	.....	.....	.....	.....
5,960	81,716	.....	15,499	.....	5,121	13,199	.....	1,661	.....	.....	.....	.....	1,005	41	1,032
25	373	.....	.....	.....	10	21	.....	.....	.....	.....	.....	.....	.....	.....	.....
13,727	$202,472	$4,350	$35,475	$1,926	9,718	$24,888	$286	$9,198	$363	$855	$137	$18	$6,319	$41	$3,713
.....	.....	$45	.....	.....	.....	.....	$11	.....	.....	.....	.....	.....	.....	.....	.....
74	$1,792	.....	$52	.....	91	$292	.....	.....	.....	.....	.....	$15	.....	.....	.....
4,218	57,187	230	2,685	.....	4,839	11,029	.....	$3,240	.....	.....	.....	.....	$1,016	$705	$1,901
452	4,871	.....	.....	.....	1,396	1,671	.....	.....	.....	.....	.....	.....	.....	.....	56
334	4,172	.....	223	.....	222	496	.....	118	.....	.....	.....	.....	.....	.....	.....
168	1,457	.....	1,577	.....	26	38	4	.....	$12	.....	.....	.....	.....	645	2
.....	.....	96	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	296	.....	.....	.....	18	50	.....	.....	.....	.....	.....	.....	.....	.....	.....
78	4,601	.....	.....	.....	78	547	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	245	.....	.....	.....	40	60	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	619	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5,364	$74,673	$371	$5,154	.....	6,710	$14,183	$15	$3,358	$12	.....	.....	$15	$1,016	$1,350	$1,959
113,135	$1,402,594	$14,431	$209,520	$33,368	90,896	$182,767	$2,240	$41,858	$5,238	$9,077	$54,726	$9,556	$67,096	$33,923	$77,060

United Kingdom Rubber Statistics

Imports

UNMANUFACTURED	April, 1923 Pounds	April, 1923 Value	April, 1924 Pounds	April, 1924 Value
Crude rubber				
From—				
Straits Settlements	5,293,400	£345,266	4,587,700	£253,693
Federated Malay States	2,751,200	180,883	2,292,100	128,121
British India	618,600	40,071	946,400	51,797
Ceylon and Dependencies	1,581,600	104,369	1,500,900	85,465
Other Dutch Possessions in Indian Seas	146,200	10,355	170,500	9,522
Dutch East Indies (except Other Dutch Possessions in Indian Seas)	932,000	59,676	605,400	36,803
Other countries in East Indies and Pacific, not elsewhere specified	103,300	7,282	105,200	5,720
Brazil	157,900	9,692	423,800	17,868
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	.....	.....	200	9
West Africa:				
French West Africa	161,200	8,478	113,200	5,237
Gold Coast	11,200	435	30,600	1,236
Other parts of West Africa	130,500	3,844	83,900	3,634
East Africa, including Madagascar	53,900	2,978	35,500	1,839
Other countries	27,000	1,379	75,000	5,267
Totals	11,968,000	£774,708	10,970,400	£606,211
Waste and reclaimed rubber	241,900	3,044	301,600	4,286
Gutta percha and balata	428,400	57,463	896,200	123,644
Rubber substitutes	.....	.....	.....	.....
Totals	12,638,300	£835,215	12,168,200	£734,141
MANUFACTURED				
Boots and shoes...*doz. pairs*	22,682	£40,092	33,600	£58,121
Tires and tubes				
Pneumatic				
Outer covers	.....	447,788	.....	192,503
Inner tubes	.....	41,791	.....	46,232
Solid tires	.....	22,545	.....	20,601
Other rubber manufactures	.....	92,007	.....	115,421
Totals	.....	£644,223	.....	£432,878

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,121,200	£12,567	1,082,200	£9,675
Rubber substitutes	79,700	1,498	104,600	1,866
Totals	1,200,900	£14,065	1,186,800	£11,541
MANUFACTURED				
Boots and shoes...*doz. pairs*	13,789	£21,795	25,139	£34,904
Tires and tubes				
Pneumatic				
Outer covers	.....	98,025	.....	162,364
Inner tubes	.....	18,968	.....	33,282
Solid tires	.....	22,832	.....	24,161
Other rubber manufactures	.....	242,613	.....	247,660
Totals	.....	£404,233	.....	£502,371

Exports—Colonial and Foreign

UNMANUFACTURED	April, 1923 Pounds	April, 1923 Value	April, 1924 Pounds	April, 1924 Value
Crude rubber				
To—				
Russia	.....	.....	.....	.....
Sweden, Norway and Denmark	73,900	£5,189	267,500	£14,894
Germany	1,336,300	88,747	1,894,800	105,693
Belgium	394,300	27,016	293,100	15,345
France	3,848,000	271,860	3,634,100	186,373
Spain	19,200	1,342	55,700	3,071
Italy	1,017,300	71,533	1,183,000	59,641
Austria	100	4	500	41
Hungary	.....	.....	22,400	1,133
Other European countries	32,000	2,108	287,300	14,222
United States	14,369,700	993,700	2,164,400	120,429
Canada	699,900	39,905	379,200	20,401
Other countries	151,200	10,001	53,700	2,680
Totals	21,941,900	£1,511,405	10,235,700	£543,923
Waste and reclaimed rubber	12,400	42	7,200	77
Gutta percha and balata	74,500	8,328	40,800	4,592
Rubber substitutes	.....	.....	1,500	33
Total	22,028,800	£1,519,775	10,285,200	£548,625
MANUFACTURED				
Boots and shoes...*doz. pairs*	3,686	£5,455	226	£736
Tires and tubes				
Pneumatic				
Outer covers	.....	5,766	.....	45,771
Inner tubes	.....	868	.....	2,099
Solid tires	.....	854	.....	942
Other rubber manufactures	.....	2,071	.....	5,872
Totals	.....	£15,014	.....	£55,420

Landings, Deliveries and Stocks in London and Liverpool During April

	Landed April Tons	Delivered April Tons	Stocks April 30 1924 Tons	Stocks April 30 1923 Tons	Stocks April 30 1922 Tons
London:					
Plantation	4,131	5,206	54,252	58,396	68,508
Other grades	6	....	107	100	129
Liverpool:					
Plantation	†290	†321	†5,081	†6,165	†7,089
Pará and Peruvian	545	340	790	319	985
Other grades	....	....	210	237	431
Total tons, London and Liverpool	4,972	5,867	60,440	65,217	77,142

† Official returns from the six recognized public warehouses.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
MAY 25. By "Socrates," Para.					
H. A. Astlett & Co.	194	4	182	...	...
H. A. Astlett & Co.	‡292	...	...	...	...
Paul Bertuch	62	...	...	363*	...
General Rubber Co.	...	11	41	5	...
L. Littlejohn & Co., Inc.	157	...	...	327	...
Meyer & Brown, Inc.	891	...	...	330	...
Poel & Kelly, Inc.	...	9	44	358	...
Fred Stern & Co., Inc.	...	...	...	131	...
MAY 29. "Benedict," Manaós.					
H. A. Astlett & Co.	...	...	55	138	...
Paul Bertuch	100	...	...	33	...
General Rubber Co.	325	5	125	11	...
L. Littlejohn & Co., Inc.	268	...	118	1,012	...
Meyer & Brown, Inc.	144	...	...	161	...
Poel & Kelly, Inc.	79	16	167	390	...
Fred Stern & Co., Inc.	3	...	7	5	...
JUNE 12. By "Linnell," Para.					
H. A. Astlett & Co.	...	...	10	...	...
Paul Bertuch	154	...	...	250	...
Poel & Kelly, Inc.	...	...	4	...	...
JUNE 12. By "Stephen," Manaós.					
H. A. Astlett & Co.	65	...	8	7	...
H. A. Astlett & Co.	‡130	...	...	...	...
Paul Bertuch	31	...	...	...	...
General Rubber Co.	164	6	134	...	...
L. Littlejohn & Co., Inc.	403	...	57	350	...
Meyer & Brown, Inc.	329	...	...	...	...
Poel & Kelly, Inc.	373	2	57	327	...
Fred Stern & Co., Inc.	72	...	...	...	...
Ultramares Corp.	8	...	...	...	...

‡ Washed and dried in Brazil.
* Bales.

Plantations

MAY 18. By "City of Manila," Far East.
H. A. Astlett & Co. 2,579 cases
H. A. Astlett & Co. *56 cases
Baird Rubber & Trading Co., Inc. 1,170 cases
H. Muehlstein & Co., Inc. 217 cases
Vernon Metal & Produce Co., Inc. 682 cases

MAY 18. By "Steel Worker," Far East.
Meyer & Brown, Inc. 435 cases
H. Muehlstein & Co., Inc. 313 cases

MAY 19. By "Kabinga," Far East.
H. A. Astlett & Co. 871 cases
Baird Rubber & Trading Co., Inc. *2,299 cases
Meyer & Brown, Inc. 2,348 cases
H. Muehlstein & Co., Inc. 1,512 cases
Poel & Kelly, Inc. 6,274 cases
Vernon Metal & Produce Co., Inc. 904 cases

MAY 19. By "Markalla," Far East.
H. A. Astlett & Co. 56 cases
Baird Rubber & Trading Co., Inc. 224 cases
Paul Bertuch 112 cases

MAY 19. By "Veendyk," Far East.
H. A. Astlett & Co. 102 cases
Baird Rubber & Trading Co., Inc. 627 cases
Baird Rubber & Trading Co., Inc. *60 cases
Fisk Rubber Co. 1,118 cases
L. Littlejohn & Co., Inc. 5,013 cases
Meyer & Brown, Inc. 852 cases
H. Muehlstein & Co., Inc. 1,300 cases
Poel & Kelly, Inc. 2,986 cases
Vernon Metal & Produce Co., Inc. 320 cases

MAY 20. By "American Banker," London.
General Rubber Co. 570 cases

MAY 21. By "West Calumb," Far East.
Baird Rubber & Trading Co., Inc. 793 cases
Fisk Rubber Co. 712 cases
F. R. Henderson & Co., Inc. 277 cases
L. Littlejohn & Co., Inc. 1,755 cases
Meyer & Brown, Inc. 1,759 cases
H. Muehlstein & Co., Inc. 1,600 cases
Poel & Kelly, Inc. 3,410 cases
Fred Stern & Co. 200 cases
Vernon Metal & Produce Co., Inc. 64 cases
Chas. T. Wilson Co., Inc. 69 cases

MAY 22. By "President Adams," Far East.
Baird Rubber & Trading Co., Inc. 200 cases
Fisk Rubber Co. 4,592 cases
General Rubber Co. 448 cases
Hood Rubber Co. *154 cases
L. Littlejohn & Co., Inc. 585 cases
Meyer & Brown, Inc. 1,580 cases
Poel & Kelly, Inc. 795 cases
Vernon Metal & Produce Co., Inc. 64 cases
Chas. T. Wilson Co., Inc. 637 cases

MAY 22. By "Southwestern Miller," Far East.
H. A. Astlett & Co. 369 cases
Baird Rubber & Trading Co., Inc. 450 cases
General Rubber Co. 1,486 cases
Hood Rubber Co. *692 cases
J. T. Johnstone & Co., Inc. 778 cases
L. Littlejohn & Co., Inc. 6,581 cases
Meyer & Brown, Inc. 1,222 cases
H. Muehlstein & Co., Inc. 1,300 cases
Poel & Kelly, Inc. 6,068 cases
Vernon Metal & Produce Co., Inc. 901 cases
Chas. T. Wilson Co., Inc. 1,646 cases

MAY 23. By "Port Lincoln," London.
H. A. Astlett & Co. 127 cases
F. R. Henderson & Co., Inc. 8 cases
Chas. T. Wilson Co., Inc. 30 cases

MAY 25. By "Minnewaska," London.
General Rubber Co. 2,493 cases

*Arrived at Boston.

MAY 27. By "Franconia," London.
General Rubber Co. 401 cases
Poel & Kelly, Inc. 1,757 cases
Vernon Metal & Produce Co., Inc. 78 cases

MAY 29. By "Knight Templar," Far East.
H. A. Astlett & Co. 900 cases
Baird Rubber & Trading Co., Inc. 1,111 cases
Fisk Rubber Co. 752 cases
General Rubber Co. 2,707 cases
F. R. Henderson & Co., Inc. 245 cases
Hood Rubber Co. *600 cases
J. T. Johnstone & Co., Inc. 638 cases
L. Littlejohn & Co., Inc. 3,981 cases
Meyer & Brown, Inc. 1,020 cases
H. Muehlstein & Co., Inc. 774 cases
Poel & Kelly, Inc. 5,057 cases
Vernon Metal & Produce Co., Inc. 940 cases
Chas. T. Wilson Co., Inc. 970 cases

MAY 29. By "Monadnock," Far East.
Fisk Rubber Co. 504 cases
General Rubber Co. 1,150 cases
Meyer & Brown, Inc. 240 cases
Poel & Kelly, Inc. 965 cases
Chas. T. Wilson Co., Inc. 224 cases

MAY 29. By "Yomagata Maru," Far East.
H. A. Astlett & Co. 78 cases
L. Littlejohn & Co., Inc. 280 cases
H. Muehlstein & Co., Inc. 299 cases

MAY 30. By "Alaska Maru," Far East.
Baird Rubber & Trading Co., Inc. 1,360 cases
L. Littlejohn & Co., Inc. 820 cases
Fred Stern & Co., Inc. 400 cases

JUNE 1. By "Egremont Castle," Far East.
H. A. Astlett & Co. 510 cases
Baird Rubber & Trading Co., Inc. 590 cases
Fisk Rubber Co. 133 cases
General Rubber Co. 2,496 cases
L. Littlejohn & Co., Inc. 4,333 cases
Meyer & Brown, Inc. 922 cases
H. Muehlstein & Co., Inc. 760 cases
Fred Stern & Co., Inc. 725 cases
Vernon Metal & Produce Co., Inc. 231 cases

JUNE 2. By "Belgenland," London.
Fred Stern & Co., Inc. 754 cases

June 3. By "Laconia," Far East.
Poel & Kelly, Inc. 173 cases

JUNE 4. By "American Shipper," London.
General Rubber Co. 2,691 cases

JUNE 4. By "City of Rangoon," Far East.
Baird Rubber & Trading Co., Inc. 280 cases
H. Muehlstein & Co., Inc. 700 cases
Poel & Kelly, Inc. 46 cases
Chas. T. Wilson Co., Inc. 580 cases

JUNE 4. By "President Garfield," Far East.
General Rubber Co. 448 cases
L. Littlejohn & Co., Inc. 2,227 cases
Meyer & Brown, Inc. 325 cases
H. Muehlstein & Co., Inc. 290 cases
Poel & Kelly, Inc. 780 cases
Chas. T. Wilson Co., Inc. 307 cases

JUNE 9. By "Bowes Castle," Far East.
H. A. Astlett & Co. 290 cases
Baird Rubber & Trading Co., Inc. 613 cases
General Rubber Co. 2,388 cases
L. Littlejohn & Co., Inc. 8,505 cases
Meyer & Brown, Inc. 2,784 cases
H. Muehlstein & Co., Inc. 1,200 cases
Poel & Kelly, Inc. 3,088 cases
Fred Stern & Co., Inc. 93 cases
Chas. T. Wilson Co., Inc. 440 cases

JUNE 9. By "Minnetonka," Europe.
L. Littlejohn & Co., Inc. 80 cases

JUNE 9. By "Verentia," London.
Poel & Kelly, Inc. 19,759 cases
Vernon Metal & Produce Co., Inc. 71 cases

JUNE 10. By "American Trader," London.
General Rubber Co. 5,175 cases

JUNE 13. By "Atreus," Far East.
H. A. Astlett & Co. 630 cases
Baird Rubber & Trading Co., Inc. 1,215 cases
Baird Rubber & Trading Co., Inc. *125 cases
Fisk Rubber Co. 588 cases
General Rubber Co. 2,020 cases
F. R. Henderson & Co., Inc. 285 cases
Hood Rubber Co. *280 cases
J. T. Johnstone & Co., Inc. 1,022 cases
L. Littlejohn & Co., Inc. 3,484 cases
Meyer & Brown, Inc. 904 cases
Poel & Kelly, Inc. 3,613 cases
Fred Stern & Co., Inc. 415 cases
Vernon Metal & Produce Co., Inc. 50 cases

JUNE 13. By "City of Bristol," Far East.
H. A. Astlett & Co. 1,110 cases
H. A. Astlett & Co. *112 cases
Baird Rubber & Trading Co., Inc. 933 cases
Fisk Rubber Co. 366 cases
General Rubber Co. 1,670 cases
F. R. Henderson & Co., Inc. 102 cases
J. T. Johnstone & Co., Inc. 950 cases
L. Littlejohn & Co., Inc. 3,842 cases
Meyer & Brown, Inc. 2,357 cases
Poel & Kelly, Inc. 3,656 cases
Vernon Metal & Produce Co., Inc. 353 cases

JUNE 13. By "Legie," Hamburg.
Hood Rubber Co. *49 cases

JUNE 15. By "Banka," Far East.
H. A. Astlett 102 cases
Baird Rubber & Trading Co., Inc. 1,004 cases
Baird Rubber & Trading Co., Inc. *55 cases
Fisk Rubber Co. 331 cases
General Rubber Co. 3,344 cases
J. T. Johnstone & Co., Inc. 201 cases
L. Littlejohn & Co., Inc. 3,045 cases
Meyer & Brown, Inc. 517 cases
Poel & Kelly, Inc. 2,743 cases
Vernon Metal & Produce Co., Inc. 115 cases

JUNE 15. By "Mahanada," Far East.
Poel & Kelly, Inc. 259 cases

JUNE 16. By "Scythia," London.
General Rubber Co. 1,326 cases

JUNE 17. By "American Merchant," London.
Fisk Rubber Co. 1,474 cases
General Rubber Co. 676 cases

JUNE 17. By "Vardulia," Far East.
Poel & Kelly, Inc. 1,449 cases

JUNE 19. By "President Polk," Far East.
Poel & Kelly, Inc. 972 cases
Fred Stern & Co., Inc. 212 cases

Africans

MAY 27. By "Franconia," Liverpool.
Poel & Kelly, Inc. 33 bags

JUNE 10. By "Zarembo," Bordeaux.
Poel & Kelly, Inc. 192 bags

Balata

MAY 25. By "Socrates," Brazil.
General Rubber Co. 88 cases

MAY 29. By "Benedict," Manáos.
Paul Bertuch 16 cases

JUNE 12. By "Stephen," Manáos.
Paul Bertuch 3 cases
Ultramares Corp. 97 cases

Crude Rubber Arrivals at New York as Reported by Importers—*Continued*

Centrals

JUNE 13. By "Ebro," Corinto.
Ultramares Corp. ..... 4 bales

Gutta Soh

MAY 22. By "President Adams," Far East.
F. R. Henderson & Co., Inc..... 34 cases

Rubber Latex

JUNE 1. By "Egremont Castle," Far East.
General Rubber Co..... 81,915 pounds

Guayule

MAY 21-JUNE 16. By "Railways," Mexico.
Continental Rubber Co..... 3,358 cases

Pontianak

JUNE 4. By "President Garfield," Singapore.
F. R. Henderson & Co., Inc..... 70 cases

JUNE 9. By "Bowes Castle," Far East.
General Rubber Co.....506,478 pounds

Plantation Rubber Exports from Dutch East Indies

Java and Madura

	February		Two Months Ended February	
	1923 Kilos	1924 Kilos	1923 Kilos	1924 Kilos
To—				
Netherlands	240,000	378,000	464,000	605,000
England	427,000	411,000	932,000	1,123,000
Germany	29,000	53,000	55,000	95,000
France	49,000	5,000	148,000	14,000
Italy	30,000	25,000	44,000	47,000
Canada	16,000	.....	16,000	.....
United States	3,000,000	2,186,000	4,176,000	4,059,000
Singapore	120,000	139,000	247,000	415,000
Japan	6,000	171,000	15,000	308,000
Other countries	5,000	27,000	5,000	49,000
Totals	3,922,000	3,395,000	6,102,000	6,715,000
Ports of Origin:				
Tandjong Priok	1,635,000	1,373,000	2,716,000	2,506,000
Semarang	264,000	214,000	354,000	386,000
Soerabaya	1,556,000	1,391,000	2,332,000	2,901,000
Pasoeroean	83,000	90,000	155,000	193,000
Tjilatjap	100,000	28,000	126,000	215,000

Belawan-Deli

To—				
Netherlands	348,000	114,000	1,428,000	284,000
England	102,000	487,000	1,146,000	785,000
Germany	19,000	.....	518,000	.....
France	10,000	6,000	508,000	6,000
Belgium	25,000	.....	25,000	5,000
Denmark	.....	.....	305,000	.....
Italy	.....	16,000	.....	36,000
United States	997,000	2,565,000	997,000	5,292,000
Penang	20,000	71,000	20,000	177,000
Singapore	223,000	109,000	247,000	196,000
Straits Settlements	136,000	.....	136,000	.....
Other countries	.....	23,000	.....	23,000
Totals	1,880,000	3,391,000	5,330,000	6,804,000

Plantation Rubber Exports from Dutch East Indies

Java and Madura

	March		Three Months Ended March	
	1923 Kilos	1924 Kilos	1923 Kilos	1924 Kilos
To—				
Netherlands	366,000	303,000	830,000	908,000
England	380,000	676,000	1,311,000	1,799,000
Germany	11,000	35,000	66,000	130,000
France	29,000	11,000	177,000	25,000
Italy	.....	26,000	.....	73,000
Other European countries	37,000	.....	81,000	.....
Canada	.....	.....	16,000	.....
United States	1,472,000	2,221,000	5,648,000	6,280,000
Singapore	128,000	279,000	376,000	694,000
Japan	.....	76,000	15,000	384,000
Australia	36,000	18,000	41,000	18,000
Other countries	.....	13,000	.....	62,000
Totals	2,459,000	3,658,000	8,561,000	10,373,000
Ports of Origin:				
Tandjong Priok	882,000	1,281,000	3,593,000	3,787,000
Samarang	143,000	246,000	497,000	632,000
Soerabaya	1,100,000	1,418,000	3,432,000	4,319,000
Pasoeroean	88,000	155,000	243,000	348,000
Tjilatjap	1,000	151,000	127,000	366,000

Belawan-Deli

To—				
Netherlands	84,000	168,000	1,512,000	452,000
England	159,000	306,000	1,305,000	1,091,000
Germany	8,000	30,000	526,000	30,000
France	.....	14,000	508,000	20,000
Belgium	2,000	.....	27,000	5,000
Denmark	.....	.....	305,000	.....
Italy	.....	.....	.....	36,000
United States	3,101,000	2,114,000	4,098,000	7,406,000
South America	.....	.....	.....	.....
Singapore	324,000	67,000	571,000	263,000
Straits Settlements	.....	.....	136,000	.....
Penang	35,000	72,000	55,000	249,000
Other countries	.....	42,000	.....	65,000
Totals	3,713,000	2,813,000	9,043,000	9,617,000

British Malaya

Rubber Exports in May

An official cablegram from Singapore states that the amount of rubber exported from British Malaya in the month of May was 19,700 tons. The amount of rubber imported during the month was 7,300 tons. In this latter figure no deduction has been made for moisture in the native rubber from the Netherlands East Indies. The cabled figures are to the nearest hundred tons.

The following are the comparative statistics of exports and imports during the first five months of 1923 and 1924.

	1923		1924	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	22,871	4,358	23,844	8,867
February	19,907	4,089	19,395	7,440
March	23,646	5,108	22,294	8,269
April	24,008	5,389	20,551	7,909
May	20,115	5,020	19,700*	7,300*

Distribution

The following is a comparative return of distribution of shipments during the months of May, 1923, and April and May, 1924. The figures for May, 1924, are to the nearest hundred tons:

Destination	May, 1923 Tons	April, 1914 Tons	May, 1924 Tons
United Kingdom	3,414	2,062	2,800*
United States of America	14,191	15,061	12,700*
Continent of Europe	1,219	1,980	2,200*
British Possessions	446	535	600*
Japan	829	872	1,400*
Other Countries	16	41	.....
Totals	20,115	20,551	19,700*

* To the nearest hundred tons.

TIRE AND RIM ASSOCIATION REPORT OF RIMS INSPECTED AND APPROVED DURING MAY, 1924

Size	Number	Per Cent
Clincher Rims		
26 x 3	none	none
28 x 3	none	none
30 x 3	16,154	0.9
30 x 3½	880,610	47.0
31 x 4	33,432	1.8
Straightside Passenger		
27 x 3½	488	0.0
28 x 3½	110,897	5.9
29 x 3½	503	0.0
30 x 3½	141,394	7.6
32 x 3½	1,417	0.1
28 x 4	114,857	6.1
28 x 4 Airplane	45	0.0
29 x 4	124,364	6.5
30 x 4	42,710	2.3
31 x 4	3,414	0.2
32 x 4	94,418	5.0
33 x 4	4,508	0.4
29 x 4½	62,654	3.3
30 x 4½	48,132	2.5
31 x 4½	25,224	1.3
32 x 4½	113,516	6.1
34 x 4½	14,162	0.8
30 x 5	4,983	0.3
31 x 5	7,075	0.4
33 x 6	644	0.0
Truck Rims		
30 x 5	3,277	0.2
34 x 5	16,800	0.9
32 x 6	3,544	0.2
36 x 6	3,386	0.2
38 x 7	1,169	0.1
40 x 8	1,023	0.1
Total	1,874,800	100.0

"PNEUMATIC TIRES," by HENRY C. PEARSON. An encyclopedia of tire manufacture, repair, rebuilding, machinery and processes. The only authoritative book on the tire industry.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC
GUTTA-PERCHA
Reg. U.S. Pat. Off.
Reg. United Kingdom.

Vol. 70 JULY 1, 1924 No. 4

TABLE OF CONTENTS

Editorials — Pages
Is the Crêpe Sole Patented? 639
Estimating Tire Stocks 639
Rubber Floors, Soles and Heels 640
An Export Sermonette 640
Factories and Universities 640

Rubber Sleeves Protect Propeller Shafting from Corrosion ..... Illustrated 641-642

Curing Tires at Low Pressure. By J. M. Ball 642

Manufacture of Automobile Topping ..... Illustrated 643-645

American Controlled Crude Rubber 645

Rotogravure Printing on Rubber ..... Illustrated 646-647

Balloon Tire Wheels ..... Illustrated 648

The Question of Exclusive Tire Sales Territory. By H. P. Wilkin 649-650

April Exports of Rubber Goods Increase 650

The World's Production and Consumption of Crude Rubber ..... Map 651-652

Tire Factory Manufacturing Costs—IV. By Joseph J. Dawson 653-654

Graphical Analysis of the World's Rubber Industry Graphs 655

Chemistry
What the Rubber Chemists Are Doing 656-658
Chemical Patents 658-659

American Society of Testing Materials Meeting 659

Method of Producing Carbon Black 659

Rubber Compounding Laboratory ..... Illustrated 660

New Machines and Appliances ..... Illustrated 661-663
Toggle Joint Vulcanizing Press. Automatic Balloon Tire Chuck Tuxeda Swing Joint. Cutting and Seaming Press. Reflector for Industrial Lighting. Cement Mixer for Spreader. Automatic Stock Cutter for Tubing Machines.

Machinery Patents ..... Illustrated 663-664
Manifold Coupling. Machine for Inflating Hollow Articles. Self Stripping Mold. Bead Stapling Machine. Tire Machine. Multiple Roll Calender. Tire Making Machine. Vulcanizing Apparatus. Rubber Masticator and Mixer. Mandrel Pulling Device. Other Machinery Patents.

Process Patents 664

Editor's Book Table 665
"Aniline and Its Derivatives." "Guide Officiel—Sixième Exposition Internationale Caoutchouc, Autres Produits Tropicaux et Industries Connexes." "Inventor's Manual—How to Make a Patent Pay." "Popular Research Narratives—Tales of Discovery, Invention and Research." "L'Industrie Du Caoutchouc."

New Trade Publications 665

Abstracts of Recent Rubber Articles 665-666

Judicial Decisions 666

New Goods and Specialties ..... Illustrated 667-669
Stemless Football Bladders. A Cushioned Rubber Paving Block. Sponge Rubber Chair Cushion. Rubber Shock Absorbers for Hammers. The "Dunlop Clipper" Makes its Debut in America. New Characters in Miller Inflated Toys. Rubber Massage Cap for Beauty Parlors. Non-Breakable Rubber Buttons. Vacuum Rubber Cup Display Equipment. New Type of Balloon Toy. New Slazenger Tennis Ball. Sponge Rubber Ear Cushions for Radio Receivers. Rubber Spats from Old Inner Tubes. Submarine Water Guard Bathing Cap. Sturdy Waterproof Hunting Boot. Inner Tube with Self-Sealing Feature. Automatically Adjusted Tire Flap. A New Airless Tire. Obstacle Golf—a New Lawn Game.

Inquiries and Trade Opportunities 671

Foreign Rubber Trade Information 671

Rubber Association of America, Inc.—Activities of ... 670-671

American Rubber Trade—News and Personals
Rubber Industry Outlook 672
Financial 672
Stock Quotations 672-673
Dividends 673
New Incorporations 673
East and South 673-675
George Washington Daum. Portrait and Sketch 675
New Jersey 675-676
Rhode Island 676-677
Massachusetts 677-678
Ohio ..... Illustrated 678-681
Midwest 681
Pacific Coast 682-683
Canada 683

Canadian Rubber Industry Census for 1922. By Consul G. R. Taggart 684

Sixth International Exhibition ..... Illustrated 685-686

M. M. Dessau ..... Portrait and Sketch 686

Foreign Rubber News
Europe 687-689

Foreign Tariffs 689

Planting
Far East ..... By Our Correspondent 690-691

Patents Relating to Rubber 692-693
United States. Canada. United Kingdom. New Zealand. Germany.

Trade Marks 693-694
United States. Canada. United Kingdom.

Designs ..... Illustrated 694-695
United States. Canada.

Rubber Floorings Give Satisfaction 695

April Tire Exports Improve 695

The Cotton Outlook 701-702

Markets
Crude Rubber ..... Graph 696-697
New York Average Spot Rubber Prices 696
Highest and Lowest New York Spot Rubber Prices 697
Reclaimed Rubber 697-698
Rubber Scrap 698
Chemicals and Other Ingredients 699-700
Cotton and Other Fabrics ..... Graph 701
Metal Market Review 703

Statistics
Canada, Statistics for March, 1924 706
Dutch East Indies Rubber Exports 709
Malaya, British, Rubber Exports 709
United Kingdom, Statistics for April, 1924 707
London and Liverpool Landings, Deliveries and Stocks 707
United States
Exports of India Rubber Manufactures During April, 1924 704-707
Imports by Months, During 1924 706
Crude Rubber Arrivals at New York as Reported by Importers 708-709
Custom House Statistics 706
Statistics for April, 1924 698

Tire and Rim Association Report of Rims Inspected and Approved During May, 1924 709

Thermoid Brake Lining

Hydraulic Compressed

THERMOID RUBBER COMPANY

Factories and Main Office: TRENTON, N. J.

Branches:

New York Atlanta Los Angeles Cleveland
Boston Detroit Chicago Kansas City Seattle
London Paris Turin

R. S. HARDY CO.

Crude Rubber

and

Balata

44 Broad Street, New York

Telephones, Broad 0867, 0868, 0869, 0870

AKRON-WILLIAMS

Tire Factory Equipment

Cores, Molds, Hydraulic Presses, Platen Presses. Manufacturers of all kinds of tire building equipment also tire repair equipment.

Licensed manufacturers of De Mattia Type Cores.

Let Us Quote You on Your Requirements

THE

Williams Foundry and Machine Co.

Akron, Ohio, U. S. A.

½" three-way YARWAY HYDRAULIC VALVES for 2500 lbs. pressure on phonograph record presses built by Charles Burroughs Co.

The higher the pressure, the tighter the valve

YARWAY HYDRAULIC VALVES are pressure-packed—increasing the pressure merely makes them hold tighter. This is accomplished by the special construction and packing features, which eliminate all stuffing boxes and cup leathers.

Wear is taken care of automatically. Every time valve is operated, sealing bushings are ground to surface of plug.

YARWAY HYDRAULIC VALVE
(CASKEY PATENTS)

The YARWAY HYDRAULIC VALVE can be operated within a comparatively small radius, assuring quick and positive action and helping the operator to concentrate on his work.

Made for pressures up to 5000 lbs. per square inch, in two-, three-, and four-way types. Details and prices in Bulletin H-2—we're saving a copy for you.

YARNALL-WARING COMPANY
7602-20 Queen St.
PHILADELPHIA

Representatives in Principal Cities

Our Publicity Page

Tire Evolution Demands Study of Fundamental Principles

THE tire industry has grown to enormous proportions—that we know. Its phenomenal growth, however, was to be expected because the growth of the automotive industry has been equally phenomenal. Tires have increased in direct relation to the increased general use of automotive vehicles. Pneumatic rubber tires have been accepted as the ideal carrier for every road traveling vehicle—passenger cars, trucks, trailers, buses.

The history of the pneumatic tire and its relation to modern industry, particularly as a coefficient of the automobile, presents a valuable and no less interesting subject for both technical and casual discussion.

In a constant state of evolution and advancement, the art of tire design and of tire building is now undergoing radical changes which render a better understanding of the fundamental principles and gradual development of the pneumatic tire more important to every tire man than ever before.

"Pneumatic Tires" An Encyclopedia of the Art

"Pneumatic Tires," by Henry C. Pearson, editor of THE INDIA RUBBER WORLD, is a veritable encyclopedia of everything pertaining to this subject. Containing 1,323 profusely illustrated pages, fully indexed, it is necessary to every man in any way connected with the tire business. This is indicated by quotations from three recent reviews which follow.

A Stupendous Work

The reviewer of "The Wisconsin Motorist" writes:

"Pneumatic Tires," by Henry C. Pearson, editor of the INDIA RUBBER WORLD and author of several books about rubber and the place it holds in the present day industrial world, comprehensively treats of everything about pneumatic tires, and of everthing connected with their history, uses, care and repair, and merchandising.

It is a stupendous work. It is the most comprehensive work on pneumatic tires we have ever seen—or ever expect to see. It is comprehensive in both its subject matter and treatment. It is not wholly a technical work only describing tire manufacture. It is written also for the great number of persons whose interest in tires comes from handling, repairing, and using them. Briefly it is a record of what has been done in tire manufacturing from the beginning.

Written by a Recognized Authority

Regarding the authority of the author and his equipment for the task "The Ford Owner & Dealer" has this to say:

The writer, Mr. Pearson, is recognized throughout the entire rubber industry as an arbiter upon matters in his field. He is a practical rubber man, has made tires, and has studied the subject in the leading factories in this country and Europe. As editor of the INDIA RUBBER WORLD he is in a position to gather material not accessible to others. In his preface, therefore, he says he "presents this book with confidence that somewhere in its pages will be found matter of value to all who in any way are interested in rubber tires—a subject whose past history has revolutionized the methods of travel and whose future holds almost inexhaustible possibilities."

Commended at Home and Abroad

Similar commendation has been received not only from periodicals at home but from practically all of the rubber trade papers abroad. For example, the following is quoted from the "Indische Mercuur," published in the far-away Netherlands East Indies:

In 1906 Mr. Pearson published a résumé of the machines and manufacturing processes then used in the manufacture of automobile and cycle tires. Anyone comparing that little book with the present stout volume realizes how very many new points of view have been opened up just within these last few years, especially in the manufacture of cord tires for touring cars and trucks.

And so a fairly complete encyclopedia arose which was badly needed; a work of great importance for the dealer in and the consumer of rubber tires as well as of importance to the engineer and manufacturer.

Rubber literature has been enriched by a good book.

This comprehensive work, a veritable encyclopedia of tire manufacture, history, processes, machinery, modern repair, rebuilding, patents, etc., is the only textbook of a great industry embracing automobile, truck, airplane, motorcycle and bicycle tires. At $12.00 postpaid to any address it represents an invaluable high dividend paying investment to everybody in any way connected with any branch of the tire business.

Waterproofed, Rubberized and Combined

COATED FABRICS

Single and Double Texture for Automobile Tops, Raincoats, Etc.

Centrally Located for Middle West Shipments

THE TOLEDO AUTO FABRICS CO. Toledo, Ohio